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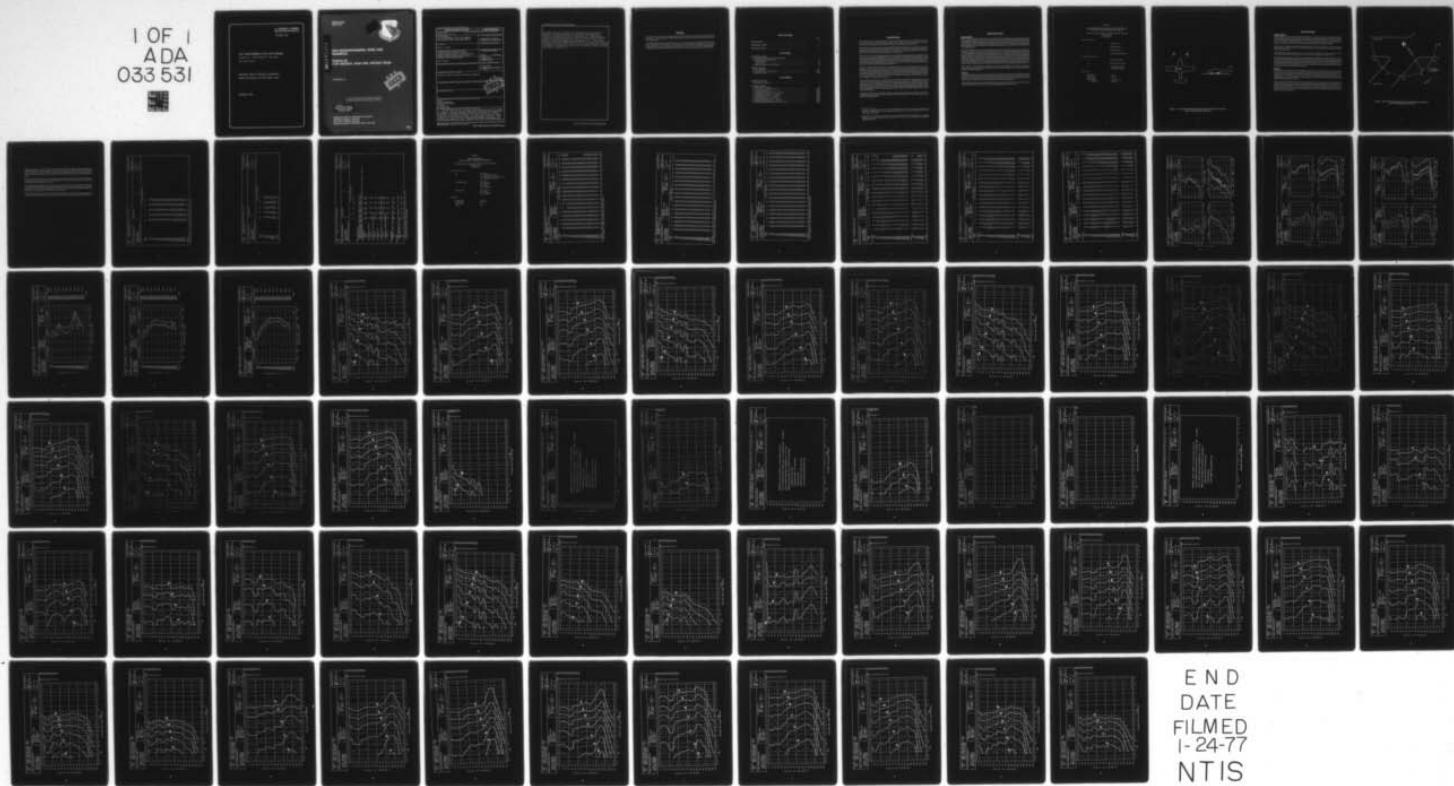
AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OHIO F/G 1/3
USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK. VOLUME 65. T-37B AIR--ETC(U)
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USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK
VOLUME 65. T-37B AIRCRAFT, NEAR AND
FAR-FIELD NOISE

AEROSPACE MEDICAL RESEARCH LABORATORY,
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

NOVEMBER 1975

ADA033531

AMRL-TR-75-50
Volume 65



USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

**Volume 65
T-37B AIRCRAFT, NEAR AND FAR-FIELD NOISE**

NOVEMBER 1975

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AEROSPACE MEDICAL RESEARCH LABORATORY
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WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AMRL-TR-75-50, Vol. 65	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK: T-37B Aircraft, Near and Far-Field Noise		5. TYPE OF REPORT & PERIOD COVERED Volume 65 of a series
7. AUTHOR(s) Robert G. Powell		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Aerospace Medical Research Laboratory Aerospace Medical Division, Air Force Systems Command, Wright-Patterson AFB, OH 45433		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 62202F 7231-04-18
11. CONTROLLING OFFICE NAME AND ADDRESS Same as above		12. REPORT DATE November 1975
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 79
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Noise Noise Environments Bioenvironment Noise Aircraft T-37B Aircraft		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The USAF T-37B aircraft is a flight trainer powered by two J69-T-25 turbojet engines. This report provides measured and extrapolated data defining the bioacoustic environments produced by this aircraft operating on a concrete runup area for three power conditions. Near-field data are reported for four locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for		

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total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 19 locations are normalized to standard meteorological conditions and extrapolated from 75-8000 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application", AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

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PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 723104, Measurement of Noise and Vibration Environments of Air Force Operations.

The author gratefully acknowledges Mr. John Cole for his assistance in preparing this report, Mr. Robert England for his assistance in acquiring the raw data, Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton for assistance in the mechanics of data processing and Mrs. Norma Peachey and Mr. Mike Patterson for assistance in typing and preparation of the graphics.

Table of Contents

	<i>Page</i>
INTRODUCTION	3
NEAR-FIELD NOISE	4
FAR-FIELD NOISE	7

List of Tables

NEAR-FIELD NOISE	
1. Measurement Locations and Test Conditions	5
2. Measured Sound Pressure Level	
1/3 Octave Band	10
Octave Band	11
3. Measures of Human Noise Exposure	12
FAR-FIELD NOISE	
4. Test Conditions	13
5. Measured Sound Pressure Level	14-16
6. Directivity Index	17-19

List of Figures

NEAR-FIELD NOISE	
1. Measurement Locations	6
FAR-FIELD NOISE	
2. Measurement Locations	8
3. Normalized Far-Field Noise Levels	20-22
4. Acoustic Power Level	23-25
5. Overall Sound Pressure Level — Contours	26-28
6. C-Weighted Sound Level — Contours	29-31
7. A-Weighted Sound Level — Contours	32-34
8. Perceived Noise Level — Contours	35-37
9. Speech Interference Level — Contours	38-40
10. Permissible Exposure Time — Contours	41-48
11. Octave Band Sound Pressure Level — Contours	49-75

INTRODUCTION

The USAF T-37B is a trainer-type aircraft to teach all techniques and maneuvers of fighter aircraft and is powered by two J69-T-25 turbojet engines. The aircraft was manufactured by the Cessna Company and the engines by the Continental Aviation and Engineering Corporation.

This volume provides measured and extrapolated data defining bioacoustic environments produced by this aircraft during ground runup operations. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with ground runups of the T-37B aircraft.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and aerospace ground equipment. The far-field, community-type noise data in the handbook describe the noise produced during *ground operations* of aircraft, aerospace ground equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15°C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure), to derive comparable data for other meteorological conditions. Refer to Volumes 1 and 2 (references 1 and 2) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of each updated index.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; AUTOVON 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

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1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook Volume 1: Organization, Content and Application*, AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.
 2. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise*, AMRL-TR-75-50 (2), AMRL, WPAFB, OH, 1975.

NEAR-FIELD NOISE

MEASUREMENTS

AMRL acquired near-field noise data on the T-37B aircraft during ground runup operations of its turbojet engines. For these tests the aircraft was located on a taxiway at Wright-Patterson AFB with no significant reflecting surfaces in the vicinity except the ground plane. Table 1 gives the surface meteorological conditions and the three engine/power conditions. The ground-crew chief selected power conditions and near-field locations generally used during routine maintenance or engine runup for preflight checks.

At each near-field location a test engineer randomly moved a hand held microphone in and around each location, probing all areas where a crew member's head would normally be located. He recorded all of the noise samples on magnetic tape. During analysis of each sample, he determined the root-mean-square sound pressure using a 4- or 8-second integration time to derive a power-averaged level for each location. Figure 1 shows the four near-field locations where ground crews are usually located for maintenance and/or preflight checkout operations. Estimates of noise levels at other locations in the near-field are difficult since the noise source is spatially distributed, i.e., not a point source. The noise levels at near-field locations can vary widely depending upon relative distances from each noise source (intake noise, exhaust noise, panel resonances, internal engine noise through the engine wall, etc.).

Table 1 lists the numeric/alphabetic designators used on the data pages in this report to identify the measurement locations and test conditions. For example, the designator 1/A means ground crew location 1 and test condition A.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the T-37B aircraft at the four ground crew locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures given in Table 3, which are widely used to assess the effects of noise on personnel and their performance.

All near-field data are for the meteorological conditions at the time of test but are valid for all typical airbase meteorology because of the short sound propagation distances involved.

TABLE 1
MEASUREMENT LOCATIONS AND TEST CONDITIONS
FOR NEAR-FIELD NOISE MEASUREMENTS

T-37B Aircraft, Ground Runup, Wright-Patterson AFB, OH
23 August 1972
Tail #74670

Ground Crew Location

1	Engine #1 Start
2	Engine #2 Start
3	Wheel Chock Pull
4	Leak Check/Trim Operation

Aircraft Engine Operation

A	Engine #1 Idle Power
B	Both Engines Idle Power
C	Both Engines Takeoff Rated-Thrust Power

Meteorology

Temperature	25 C
Bar Pressure	.760 M Hg
Rel Humidity	84 %
Wind — Speed	3.6 M/Sec (7 kt)
— Direction	200 Deg

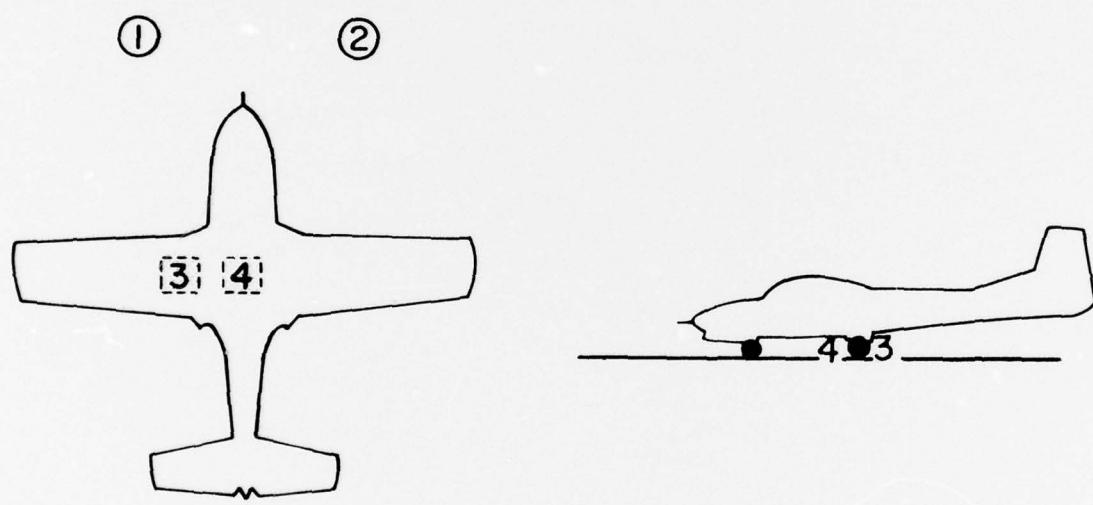


Figure 1. Near-Field Measurement Locations at Intersection of Taxiways 8 and 12, Wright-Patterson AFB, OH

FAR-FIELD NOISE

MEASUREMENTS

AMRL acquired both near and far-field data during a 1- 2-hour test period, thus keeping similar meteorological conditions. Figure 2 shows the ground runup pad, ground cover, aircraft orientation and the 19 microphone measurement sites on a semicircle. The center of the 75 meter radius semicircle used in surveying the J69-T-25 engines was on the ground directly below the intersection of the aircraft's centerline and the plane passing through both engines' exhaust-nozzle exits.

Table 4 provides cockpit readouts of engine characteristics (% RPM, fuel flow, etc.) for each power setting used in the far-field tests. Also listed in this table are the surface meteorological conditions during data acquisition.

All microphone measurement sites are in the acoustic far-field of their source where the sound wave-fronts spherically diverge and the noise source may be regarded as a point source.

A portable microphone/tape-recorder system was used to sequentially record the noise at each far-field location. The microphone was attached to a hand held pole, pointed at the source (0° angle of incidence) and vertically scanned from 0.5 to 3 meters for a period of 5-10 seconds during data acquisition at each microphone location. These samples were then time-integrated to derive a root-mean-square sound pressure level. Vertical scanning and time-integrating together reduce anomalies frequently present in data acquired by a fixed height microphone.

RESULTS

Table 5 lists the overall and 1/3 octave band SPL measured at the far-field locations under meteorological conditions at the time of the test. Data in all other figures and tables are based on these levels. These data were normalized to 100 meters distance and standard meteorological conditions (15°C temperature, 70% relative humidity, 0.760 meter Hg barometric pressure) and used to derive the graphic data in Figure 3 which provides a compact summary of the far-field noise characteristics of the T-37B aircraft in a standard format.

Figure 4 and Table 6 present two basic acoustic measures, the acoustic power level and the directivity index, respectively. The acoustic power level describes the power radiated by the source as a function of frequency. The directivity index is a standard acoustical engineering measure that describes the geometric way in which the source radiates this power as a function of both frequency and angle from source. These basic source measures are primarily of interest for acoustical engineers and noise generation/control specialists.

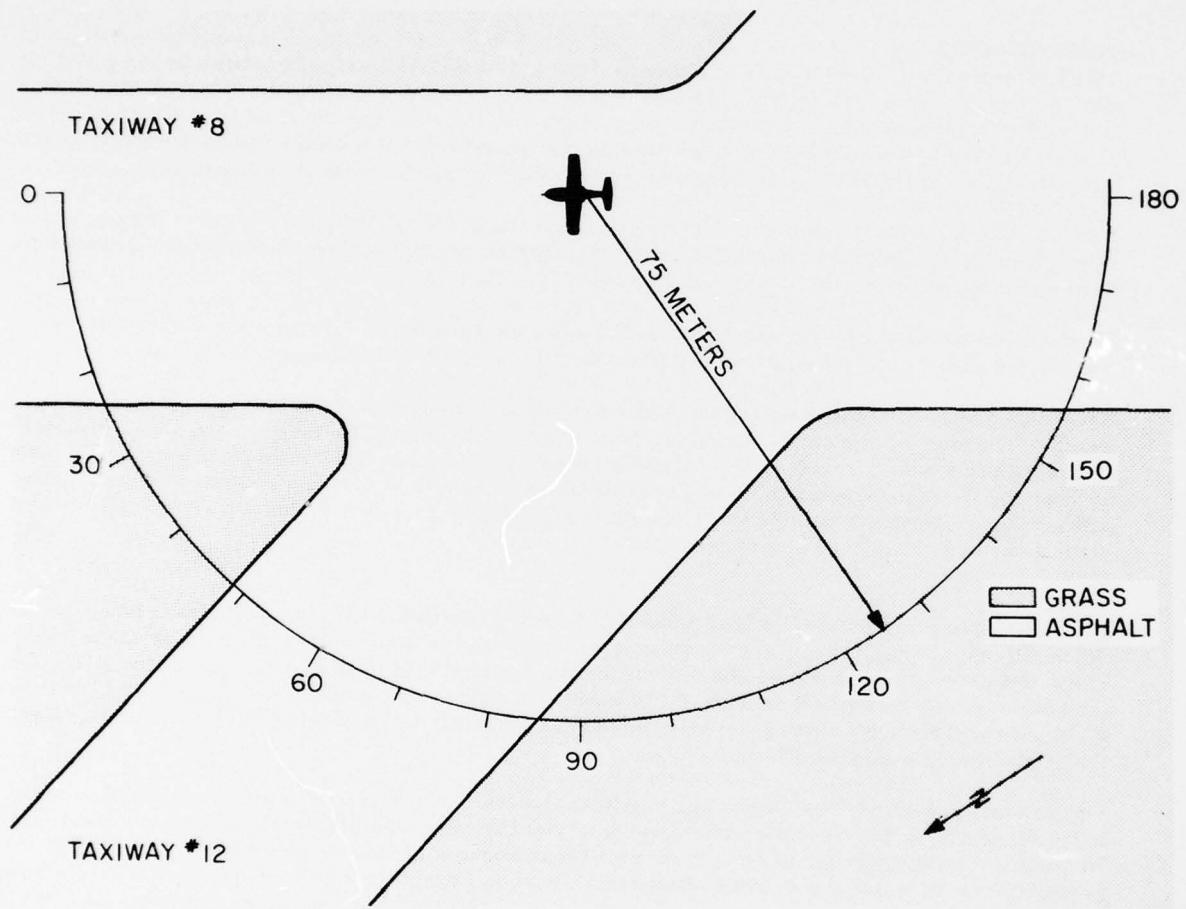


Figure 2. Far-Field Measurement Locations at Intersection of Taxiways 8 and 12, Wright-Patterson AFB, OH

Figures 5 through 11 are sets of equal noise contours describing seven different measures of noise as a function of angle and distance from the source for standard day meteorology. They are respectively, overall sound pressure level, C-weighted sound level, A-weighted sound level, perceived noise level, speech interference level, permissible exposure times for personnel and octave band sound pressure levels.

Data excessively influenced by spurious background/electronic noise were eliminated from all figures and tables. No data are presented at the 180 degree locations for the trim-check power setting because of turbulent air flow behind the aircraft.

Test personnel performed noise surveys during quiet periods when the background noise was minimal, e.g., early in the morning when no other aircraft or engine test stands were operating. Data eliminated because they were near the background/electronic noise were generally not significant because the levels were so low (e.g., Table 5 and Figure 11 at idle power).

Volume 2 of the handbook describes the influence of meteorology on far-field noise environments, and provides, if required, the factors necessary to adjust the handbook's standard meteorological day data.

TABLE: MEASURED SOUND PRESSURE LEVEL (D3)
1/3 OCTAVE BAND
2

NOISE SOURCE/SUBJECT:		OPERATION:		LOCATION/CONDITION			
T-37B AIRCRAFT		GROUND CREW		NEAR FIELD NOISE LEVELS			
FREQ (HZ)							
		1/A	2/B	3/C	4/B	4/C	
25	31.5	73	73	86	89	93	
40	50	73	83	86	89	96	
63	80	75	86	83	92	101	
86	100	79	80	95	97	104	
100	125	83	81	97	99	105	
125	160	83	83	94	97	105	
160	200	83	84	94	97	106	
200	250	82	84	95	96	113	
250	315	80	82	95	96	112	
315	400	85	86	98	98	114	
400	500	90	91	98	96	113	
500	630	93	93	93	96	112	
630	800	92	93	101	99	115	
800	1000	93	96	103	100	115	
1000	1250	96	98	103	101	116	
1250	1600	100	102	105	104	116	
1600	2000	121	124	123	125	116	
2000	2500	111	113	115	116	116	
2500	3150	99	100	103	99	115	
3150	4000	112	115	111	104	114	
4000	5000	103	106	105	100	117	
5000	6300	104	109	106	100	114	
6300	8000	101	104	102	96	113	
8000	10000	100	103	102	94	117	
10000	OVERALL	122	125	124	126	127	

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)
2 OCTAVE BAND

NOISE SOURCE/SUBJECT:		OPERATION:		IDENTIFICATION:	
T-37B AIRCRAFT	GROUND CREW	NEAR FIELD NOISE LEVELS		TEST 72-010-010	OMEGA 3•2
				RUN 01	
				04 DEC 74	
				PAGE J1	
LOCATION/CONDITION					
FREQ (HZ)		1/A	2/B	3/C	4/D
31.5		78	88	92	95
63		36	87	100	102
125		39	89	103	107
250		87	88	101	110
500		95	96	103	101
1000		99	101	107	117
2000		122	124	123	120
4000		113	115	112	121
8000		107	111	108	106
OVERALL		122	125	124	126
					127

TABLE VI. MEASURES OF HUMAN AND ANIMAL EXPOSURE

3

TABLE I: MEASURES OF HUMAN NOISE EXPOSURE						
3						
NOISE SOURCE/SUBJECT*	OPERATION†	LOCATION/CONDITION				
T-37B AIRCRAFT GROUND CREW NEAR FIELD NOISE LEVELS) ()) ()) ()) ()) ()) ()
HAZARD/PROTECTION	C-WEIGHTED OVERALL SOUND LEVEL A-WEIGHTED OVERALL SOUND LEVEL MAXIMUM PERMISSIBLE TIME (T IN MINUTES)	(OASLC IN OBC) AT EAR (OASLA IN OBA) AT EAR FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)				
NO PROTECTION OASLC OASLA T	122 123 P	124 125 P	125 127 P	127 127 P	127 127 P	127 127 P
MINIMUM QPL EAR MUFFS OASLA*	94	96	96	97	97	101
T	85	60	60	50	50	25
AMERICAN OPTICAL 1700 EAR MUFFS OASLA*	88	90	90	91	91	96
T	240	170	170	143	143	60
V-51R EAR PLUGS OASLA*	91	93	93	94	94	99
T	143	101	101	85	85	36
AMERICAN OPTICAL 1700 EAR MUFFS PLUS OASLA*	77	79	79	V-51R EAR PLUGS 77	80	86
T	960	960	960	960	960	339
H-133 GROUND COMMUNICATION UNIT OASLA*	95	97	97	98	98	99
T	71	50	50	42	42	36
COMMUNICATION PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB) PSIL	105	107	111	110	110	119

ANNOYANCE

PERCEIVED NOISE LEVEL, TONE CORRECTED (PNL) IN dB	
TONE CORRECTION (C IN dB)	
PNLT	C
140	143
5	5
	4
	5
	0

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.
P ADDITIONAL EAR PROTECTION REQUIRED.

TABLE 4
TEST CONDITIONS
FOR FAR-FIELD NOISE MEASUREMENTS

T-37B Aircraft, Ground Runups, Wright-Patterson AFB, OH
23 August 1972
Tail #74670

Aircraft Engine Operation

Idle	Both Engines 37 % RPM NC (Core Speed) 565 C EGT (Exhaust Gas Temperature) 300 LBS/HR FF (Fuel Flow)
Trim Check Power	Both Engines 92 % RPM NC 560 C EGT 800 LBS/HR FF
Military Power	99.5 % RPM NC 645 C EGT 1050 LBS/HR FF

Meteorology

Temperature	25 C
Bar Pressure	0.760 M Hg
Rel Humidity	84 %
Wind	Calm

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)
5
 DISTANCE = 75 METERS

NOISE SOURCE/SUBJECT:	OPERATION:										METEOROLOGY:										IDENTIFICATION:	
	T-37B AIRCRAFT	37X RPM	TEMP = 25 C	BAR PRESS = .760 HG	09 MAY 75	OMEGA 1.4					PAGE 1											
J69-T-25 ENGINE	BOTH ENGINES	REL HUMID = 84 %	PAGE 2	FAR FIELD NOISE	FREE FLOW	PAGE 1																
FREQ (HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180			
25	73	69	74	64	62	59	60	62	62	61	61	65	65	72	66	70	66	70	67	67	66	
31.5	73	68	70	62	60	57	59	59	60	57	58	59	63	64	70	63	67	67	66	67	66	
40	70	65	67	60	58	58	57	58	57	58	59	64	61	67	61	65	65	63	63	63	63	
50	65	64	65	59	60	59	60	62	64	62	62	61	65	64	67	64	67	64	63	63	60	
63	65	66	66	61	64	63	64	65	65	64	64	64	64	73	68	67	67	67	65	65	61	62
80	63	61	64	59	60	60	61	61	61	61	61	59	62	66	67	67	65	65	65	65	59	
100	63	61	62	59	61	63	63	64	65	63	63	61	67	65	69	70	69	66	66	66	66	
125	64	64	64	64	70	74	76	75	76	73	75	77	77	80	80	77	77	73	73	73	73	
160	65	64	64	63	66	68	70	72	72	70	69	72	72	74	75	73	68	67	67	67	67	
200	67	69	67	66	67	67	67	72	72	70	67	71	70	69	69	71	67	67	67	67	67	
250	66	66	66	66	69	68	69	70	67	67	64	64	65	65	66	65	67	63	63	63	63	
315	67	67	66	64	63	69	69	68	68	66	64	62	60	66	62	64	64	61	61	61	60	
400	67	65	66	64	62	67	66	68	68	69	64	63	63	65	61	62	61	61	61	61	61	
500	66	68	68	64	62	70	68	70	69	69	66	64	65	60	59	59	56	56	56	56	56	
630	69	69	66	65	69	68	68	68	68	69	65	64	65	64	59	57	56	56	56	56	56	
800	71	71	69	66	65	69	68	69	69	69	66	65	67	65	65	67	63	63	63	63	63	
1000	73	74	71	70	69	72	71	74	73	71	68	66	67	64	59	58	55	55	54	54	54	
1250	76	77	73	73	74	73	74	73	74	73	70	68	66	64	64	64	60	55	55	54	54	
1600	79	78	73	74	73	74	73	71	73	71	71	68	65	64	63	59	58	54	54	54	54	
2000	103	101	95	93	92	89	92	85	90	82	81	79	82	77	75	71	64	64	64	64	63	
2500	92	91	86	84	83	80	84	77	81	73	73	70	71	68	66	62	55	53	53	53	53	
3150	75	73	68	72	70	73	71	74	67	66	64	62	61	60	57	54	49	43	41	41	41	
4000	84	87	83	80	80	78	79	76	74	65	65	65	65	62	58	53	47	45	45	45	45	
5000	76	80	76	77	75	75	74	73	72	70	64	63	61	61	59	55	49	44	44	44	44	
6300	79	84	77	76	75	76	72	77	72	69	64	60	58	56	55	52	48	43	40	40	40	
8000	75	78	72	73	72	70	70	67	64	61	57	54	51	49	44	39	38	38	38	38	38	
10000	70	73	67	67	67	65	67	65	63	61	58	54	51	48	46	40	36	36	36	36	36	
OVERALL	104	102	96	94	93	90	93	88	91	84	84	83	85	84	83	83	78	74	72	72	72	

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

{ TABLE: MEASURED SOUND PRESSURE LEVEL (DB)

5 1/3 OCTAVE BAND

DISTANCE = 75 METERS

NOISE SOURCE/SUBJECT:		OPERATION:				METEOROLOGY:				IDENTIFICATION:							
		TRIM	CHECK	POWER		TEMP		C	BAR PRESS	HG	TEST	OMEGA					
		92%	RPM	BOTH ENGINES		68		25	• 760	%	75-002-046	1.4					
				FREE FLOW		68		REL HUMID	= 84 %		RUN	02					
FREQ	(HZ)	0	10	20	30	40	50	60	70	80	PAGE	2					
25	78	67	68	66	69	69	64	65	75	66	68	69	71	72	70	68	
31.5	78	66	68	68	66	68	66	68	67	73	68	70	72	73	76	74	71
40	75	65	66	67	67	67	70	68	69	72	70	72	75	76	79	77	72
50	72	66	68	68	69	70	70	71	72	73	72	73	75	75	80	81	79
63	71	68	69	70	70	71	72	73	74	74	74	76	79	82	83	84	79
80	70	69	71	71	71	73	73	74	75	74	74	77	81	84	86	86	80
100	71	71	72	73	73	74	76	76	78	77	77	79	84	87	90	89	80
125	72	72	73	73	73	75	76	76	79	80	80	85	88	91	90	79	69
160	72	74	74	74	74	78	79	80	80	82	83	86	90	94	92	80	69
200	74	74	76	75	75	78	79	80	82	82	83	84	87	90	95	93	80
250	79	80	79	78	78	84	84	84	86	88	85	85	89	92	97	95	81
315	80	79	80	79	77	84	85	84	86	88	85	85	84	87	93	92	80
400	80	80	81	79	76	84	85	84	86	88	86	85	86	86	90	90	69
500	78	79	80	77	77	84	85	85	86	89	86	84	87	89	89	86	79
630	79	80	79	78	77	81	83	84	86	89	87	86	87	88	90	84	74
800	78	77	78	77	78	80	83	84	85	87	87	87	88	86	88	82	71
1000	78	77	79	77	79	80	83	85	85	87	89	89	89	87	87	83	71
1250	78	78	78	79	79	80	84	86	88	86	88	89	89	87	87	82	69
1600	76	75	76	77	77	76	81	83	82	84	88	87	87	85	84	80	67
2000	78	75	75	76	77	76	80	81	82	82	88	88	87	86	83	79	66
2500	77	73	74	75	76	75	79	81	81	81	86	86	85	84	81	77	64
3150	78	73	73	73	76	76	78	79	81	82	85	85	84	82	79	75	63
4000	60	72	71	73	77	77	78	78	80	83	82	82	81	79	76	73	61
5000	91	83	84	88	92	88	90	92	89	89	85	84	79	78	76	72	61
6300	61	74	77	80	82	78	81	81	79	81	80	79	75	74	71	68	57
8000	74	72	74	76	74	76	74	77	77	77	79	77	74	71	70	66	55
10000	79	76	76	77	80	78	79	79	80	82	79	77	73	69	67	63	53
OVERALL	94	90	91	92	94	94	96	97	97	99	99	98	99	100	103	101	90

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (dB)
5
 $\frac{1}{3}$ OCTAVE BAND
DISTANCE = 75 METERS

NOISE SOURCE/SUBJECT:	OPERATION:						METEOROLOGY:						IDENTIFICATION:						
	MILITARY POWER	99.5% RPM	BOTH ENGINES	FREE FLOW	TEMP = 25 C	BAR PRESS = .760 M HG	REL HUMID = 84 %	TEST 75-002-046	RUN 03	09 MAY 75	PAGE 2	OMEGA 1.4							
FREQ (HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
T-37B AIRCRAFT	62	63	61	61	64	65	66	67	66	66	69	67	69	70	72	72	74	71	72
J69-T-25 ENGINE	66	65	65	65	68	68	67	68	70	69	71	71	74	75	75	76	75	74	74
FAR FIELD NOISE	69	66	68	67	68	69	70	71	70	71	72	72	74	76	77	79	77	74	72
25	62	63	61	61	64	65	66	67	66	66	69	67	69	70	72	72	74	71	72
31.5	66	65	65	65	68	68	67	68	70	69	70	69	71	74	75	75	76	75	74
40	69	66	68	67	68	69	70	71	70	71	72	72	74	76	77	79	77	74	72
50	70	68	69	68	71	72	73	73	73	74	75	75	77	80	82	83	80	74	69
63	73	71	71	70	73	74	75	75	75	76	78	82	83	86	85	81	70	67	67
80	78	74	72	72	74	75	76	77	77	77	79	84	86	88	87	81	63	62	62
100	75	74	73	74	74	76	79	79	80	79	81	86	90	93	90	82	63	60	60
125	76	75	75	75	75	78	79	80	80	81	82	83	88	92	95	91	82	68	60
160	77	77	77	76	78	80	82	83	81	83	84	85	89	95	98	92	81	71	64
200	78	78	78	78	77	81	82	84	84	84	85	87	90	95	98	91	81	71	66
250	84	85	83	81	81	86	85	87	88	88	88	89	94	98	101	93	84	75	70
315	84	84	84	82	81	87	86	88	88	89	87	88	89	94	97	91	81	73	67
400	83	84	84	82	79	88	88	88	89	89	88	88	92	93	93	91	81	73	68
500	84	85	85	81	79	87	88	89	89	91	89	89	94	96	92	91	80	71	67
630	83	85	84	81	80	85	87	89	89	90	91	90	94	97	94	91	79	70	67
800	83	81	83	82	82	85	87	90	89	90	91	93	95	93	93	91	77	69	65
1000	81	81	83	82	83	86	87	90	90	91	93	94	95	95	93	90	75	69	65
1250	82	81	81	82	83	85	88	90	91	92	94	93	95	94	93	86	74	67	62
1600	80	77	79	82	81	83	84	87	89	90	93	91	93	92	91	83	72	64	60
2000	80	77	79	81	81	82	83	87	88	92	91	93	91	91	91	84	71	63	58
2500	79	75	76	79	79	81	85	86	88	91	90	91	93	95	93	91	77	69	65
3150	78	75	74	77	78	80	85	83	84	86	87	88	87	85	81	68	60	56	56
4000	77	75	72	76	77	80	82	80	83	84	86	85	84	82	78	66	58	54	54
5000	85	80	77	82	81	84	83	83	83	85	86	84	83	79	75	64	56	52	52
6300	87	83	80	83	82	86	84	83	84	83	85	84	82	81	77	70	62	54	50
8000	77	72	73	74	73	76	77	78	80	82	80	82	80	79	75	67	60	51	47
10000	74	71	71	72	75	74	76	77	77	78	78	76	75	70	62	56	48	44	44
OVERALL	95	94	94	93	93	97	98	100	100	101	102	102	104	106	107	102	93	84	81

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: DIRECIVITY INDEX (DB)

6

NOISE SOURCE/SUBJECT:		OPERATION:										METEOROLOGY:										IDENTIFICATION:	
		IDLE POWER 37% RPM					TEMP = 25 C BAR PRESS = .760 M HG					REL HUMID = 84 %					TEST 75-002-046 RUN 01		OMEGA 1.4 PAGE 4				
		BOTH ENGINES FREE FLOW																					
FREQ (HZ)		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180			
1/3 OCTAVE:																							
25	7	4	9	-1	-4	-6	-5	-2	-5	-3	-3	-4	-4	-0	0	0	7	1	5	1			
31.5	11	5	7	-1	-2	-5	-4	-4	-3	-3	-5	-5	-4	-0	1	0	8	1	5	3			
40	9	5	6	-0	-2	-3	-4	-3	-3	-2	-3	-2	-2	3	1	7	1	4	3				
50	2	1	2	-4	-3	-4	-3	-1	-1	-1	-1	-2	-2	2	1	4	1	0	-3				
63	-1	-1	-1	-5	-3	-3	-3	-1	-1	-0	-2	-2	-2	6	2	0	1	-1	-5				
80	-0	-2	-1	-3	-3	-3	-2	-1	-1	-1	-1	-4	-0	3	5	3	-3	-4					
100	-3	-4	-3	-6	-4	-2	-3	-1	-1	-3	-4	-2	-0	4	5	4	1						
125	-11	-12	-12	-12	-5	-2	0	0	-5	-3	-0	1	4	4	4	2	-3	-17					
160	-6	-7	-8	-5	-3	-1	1	-1	-2	1	1	1	3	4	2	-3	-14						
200	-2	-2	-0	-2	-4	-2	-3	2	3	0	-3	1	1	-0	0	1	-3	-16					
250	-1	-1	-0	-1	-1	-2	1	2	3	0	-3	-2	-2	-1	-2	-0	-4	-17					
315	1	1	0	-2	-3	3	3	2	2	0	-2	-4	-6	0	-4	-2	-5	-16					
400	1	-1	0	-2	-3	1	1	2	3	3	-1	-2	-3	-1	-5	-3	-5	-16					
500	-0	1	1	-3	-5	3	1	3	2	2	-0	-3	-3	-1	-7	-8	-11	-23					
630	2	3	2	-1	-2	3	1	2	1	2	-1	-3	-1	-2	-7	-10	-11	-23					
800	4	4	2	-1	-2	2	1	2	1	2	-1	-2	-0	-2	-8	-10	-12	-25					
1000	3	4	1	-0	-1	2	1	4	3	1	-2	-4	-3	-6	-11	-12	-15	-26	-29				
1250	5	6	2	2	2	3	2	3	2	-1	-3	-5	-5	-7	-12	-11	-16	-25	-27				
1600	9	8	3	3	3	2	-1	3	1	0	-2	-5	-6	-8	-11	-13	-17	-25	-27				
2000	13	11	5	5	3	2	-1	2	-1	-5	-0	-8	-9	-11	-8	-13	-15	-19	-26	-27			
2500	11	10	4	5	3	2	-1	3	-4	-0	-8	-8	-11	-10	-13	-15	-19	-26	-28				
3150	6	4	-0	3	1	5	2	5	-1	-2	-5	-6	-7	-9	-12	-15	-19	-25	-28				
4000	7	6	5	3	3	3	0	2	0	-4	-12	-13	-12	-13	-16	-19	-24	-31	-32				
5000	4	9	5	5	3	3	2	2	0	-2	-8	-9	-11	-11	-13	-17	-22	-28	-31				
6300	6	11	4	3	2	3	-1	4	-1	-4	-9	-13	-15	-17	-18	-21	-25	-30	-33				
8000	7	10	4	5	4	2	2	2	-1	-4	-7	-11	-14	-17	-19	-24	-29	-30	-33				
10000	6	9	4	3	2	3	-1	-3	-1	-6	-8	-9	-13	-16	-17	-23	-27	-28					
OCTAVE																							
31.5	9	4	8	-1	-3	-6	-3	-4	-3	-4	-5	-4	-5	-3	1	1	7	1	5	2			
63	-0	-1	1	-4	-3	-3	-2	-1	-2	-1	-2	-3	-2	0	1	4	2	3	0	-3	-5		
125	-8	-9	-9	-10	-5	-2	-3	1	1	2	0	-4	0	-3	-0	-1	-6	-8	-21	-16			
250	-1	-1	-0	-2	-1	-2	-3	3	1	2	2	2	2	-1	-3	-4	4	2	-2	-16			
500	1	2	1	0	1	0	0	2	2	2	1	2	1	-2	-4	-3	-5	-11	-15	-25	-29		
1000	4	5	2	1	0	1	0	2	2	2	1	2	1	-2	-4	-8	-11	-13	-19	-26	-28		
2000	13	14	4	5	3	2	-1	2	-1	2	0	-3	-5	-8	-11	-13	-15	-18	-21	-25	-31		
4000	6	9	5	5	3	3	2	1	2	0	-3	-10	-11	-12	-12	-15	-16	-18	-23	-29	-31		
8000	6	11	4	4	2	3	0	4	-1	-4	-8	-12	-14	-16	-16	-18	-20	-24	-29	-31			
OVERALL	12	10	4	4	3	2	-1	2	-3	-0	-7	-7	-8	-6	-8	-9	-13	-17	-20				

TABLE: DIRECTIVITY INDEX (DB)
6

NOISE SOURCE/SUBJECT:		OPERATION ^a										METEOROLOGY										IDENTIFICATION			
		TRIM CHECK POWER					TEMP = 25 C					BAR PRESS = .760 Hg					TEST 75-002-046					RUN 02			
		(92% RPM BOTH ENGINES FREE FLOW)					(REL HUMID = 84 %)					(PAGE 4)					RUN 02		TEST 75-002-046		OMEGA 1.4				
FREQ (HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220		
1/3 OCTAVE																									
T-37B AIRCRAFT	25	9	-2	-3	-3	-4	-2	-1	-4	-5	-4	-3	-5	-3	-2	-0	2	3	1	-1					
J69-T-25 ENGINE	31.5	8	-4	-4	-5	-5	-5	-4	-4	-3	-3	-3	-3	-2	-0	2	3	5	4	1					
FAR FIELD NOISE	40	3	-7	-6	-6	-7	-5	-5	-5	-3	-3	-2	-2	-1	3	3	4	7	5	0					
	50	-2	-9	-8	-6	-7	-7	-5	-5	-3	-3	-4	-4	-1	1	3	6	6	4	-2					
	63	-6	-10	-9	-8	-7	-7	-5	-5	-3	-4	-4	-1	1	4	6	7	2	-6						
	80	-9	-11	-10	-9	-8	-7	-7	-6	-4	-5	-5	-2	2	4	6	7	0	-12						
	100	-11	-12	-11	-10	-9	-8	-7	-6	-4	-5	-6	-3	1	4	8	7	-3	-14						
	125	-12	-12	-11	-11	-11	-9	-7	-8	-5	-4	-4	-1	1	5	8	6	-4	-14						
	160	-13	-12	-11	-12	-11	-8	-7	-6	-5	-4	-2	0	4	8	6	6	-6	-17						
	200	-13	-12	-11	-12	-11	-8	-6	-5	-4	-2	0	3	8	6	6	-6	-17							
	250	-14	-9	-10	-11	-11	-5	-5	-3	-1	-4	-4	0	3	8	6	-8	-19							
	315	-7	-7	-6	-7	-9	-2	-1	-2	-1	-1	-1	-2	-3	0	7	6	-6	-17						
	400	-6	-6	-5	-7	-10	-2	-1	-2	0	2	-0	-1	0	0	4	4	-7	-17						
	500	-8	-7	-5	-8	-10	-2	-1	-1	0	3	0	-2	1	3	3	0	-11	-19						
	630	-7	-6	-7	-8	-9	-5	-3	-2	0	3	1	0	1	2	4	-2	-12	-21						
	800	-7	-8	-7	-8	-7	-5	-2	-1	-0	2	2	2	3	1	3	-3	-14	-23						
	1000	-8	-9	-7	-8	-7	-6	-2	-1	-1	1	3	3	3	1	2	-3	-15	-24						
	1250	-8	-8	-8	-7	-7	-6	-2	-0	-1	2	3	3	3	1	1	1	-4	-17						
	1600	-8	-9	-8	-7	-8	-3	-1	-2	0	4	3	3	3	1	0	4	-4	-17						
	2000	-6	-9	-9	-8	-7	-8	-4	-3	-2	2	4	4	3	2	-1	-5	-18	-27						
	2500	-5	-9	-8	-7	-8	-7	-3	-3	-1	-1	4	4	3	2	-1	-5	-18	-27						
	3150	-3	-6	-6	-8	-5	-5	-3	-2	-0	1	4	4	3	1	-2	-6	-18	-28						
	4000	0	-7	-8	-6	-6	-2	-1	-1	1	4	3	2	1	0	-4	-7	-19	-28						
	5000	3	-5	-4	0	4	1	2	5	1	2	-2	-4	-9	-10	-12	-15	-27	-35						
	6300	2	-5	-2	1	3	-1	2	2	0	2	1	0	-4	-5	-8	-11	-22	-30						
	8000	-2	-4	-2	0	-2	1	1	1	1	1	2	4	1	-1	-5	-6	-10	-21	-29					
	10000	1	-2	-2	-1	-2	0	1	1	1	2	4	1	-1	-5	-9	-11	-15	-25						
OCTAVE																									
31.5	6	-5	-4	-4	-5	-2	-1	-4	-4	-3	-3	-2	-2	-0	2	3	5	4	0						
	6.3	-6	-10	-9	-8	-6	-6	-5	-5	-4	-4	-3	-3	-1	4	6	7	2	-7						
	125	-12	-12	-11	-11	-11	-9	-7	-7	-5	-5	-4	-4	-3	-3	-0	2	6	6	-4	-15				
	250	-9	-9	-10	-11	-11	-11	-11	-11	-9	-9	-8	-8	-7	-7	-1	2	4	2	-9	-19				
	500	-7	-6	-6	-8	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-1	1	2	4	2	-3	-15	-25		
	1000	-8	-8	-7	-7	-8	-7	-6	-6	-6	-6	-6	-6	-6	-6	-1	3	1	2	4	-27	-35			
	2000	-6	-9	-8	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-1	4	3	2	1	-5	-17	-27		
	4000	2	-5	-1	3	0	2	-1	1	1	1	2	1	1	0	-3	-4	-7	-11	-23	-32				
	8000	1	-3	-2	0	2	-1	1	1	1	2	1	1	0	-3	-6	-8	-11	-22	-31					
OVERALL	-4	-8	-7	-6	-4	-4	-2	-1	-1	-1	-1	-1	-1	-1	1	0	1	2	5	3	-8	-17			

TABLE: DIRECTIVITY INDEX (DB)

6

NOISE SOURCE/SUBJECT:		OPERATIONS:		METEOROLOGY:		IDENTIFICATION:														
		MILITARY POWER (99.5% RPM (BOTH ENGINES (FREE FLOW		TEMP = 25 C BAR PRESS = .760 HG REL HUMID = 84 %		TEST 75-002-046 RUN 03 09 MAY 75 PAGE 4														
FREQ (HZ)	1/3 OCTAVE	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
T-37B AIRCRAFT	25	-6	-5	-7	-4	-3	-3	-1	-2	-2	-1	-2	0	2	4	4	5	2	3	
J6-1-25 ENGINE	31.5	-5	-6	-6	-3	-4	-3	-1	-2	-3	-1	-2	0	3	4	5	4	3	3	
FAR FIELD NOISE	40	-5	-7	-6	-5	-4	-3	-3	-4	-2	-2	-1	1	3	5	5	3	1	-1	
	50	-7	-9	-7	-8	-6	-4	-4	-4	-3	-2	-1	1	4	6	6	6	3	-2	
	63	-7	-8	-9	-9	-7	-6	-5	-4	-4	-4	-4	-2	4	6	6	6	1	-10	
	80	-3	-7	-10	-9	-7	-7	-6	-5	-5	-5	-5	-3	2	5	7	5	-1	-18	
	100	-10	-11	-11	-11	-11	-11	-9	-6	-5	-5	-5	-6	-3	2	5	8	-3	-22	
	125	-11	-12	-11	-11	-11	-11	-9	-7	-6	-6	-6	-5	-3	1	6	8	4	-5	
	160	-12	-12	-12	-13	-11	-12	-9	-7	-6	-6	-6	-5	-4	-0	6	9	3	-7	
	200	-12	-11	-11	-11	-11	-12	-9	-7	-5	-5	-5	-6	-5	-2	1	6	9	1	-8
	250	-9	-7	-10	-11	-11	-11	-11	-6	-7	-6	-4	-4	-3	1	5	9	0	-8	
	315	-6	-5	-6	-7	-9	-3	-3	-2	-2	-2	-2	-2	-0	5	7	1	-8	-17	
	400	-6	-5	-5	-7	-10	-1	-1	-0	-0	-0	-1	-1	-1	3	4	4	2	-8	
	500	-6	-5	-5	-9	-11	-3	-3	-1	-1	-1	-1	-1	-1	4	6	1	1	-10	
	630	-7	-6	-7	-9	-11	-5	-4	-1	-1	-1	-1	-1	-1	0	0	3	0	-12	
	800	-8	-9	-7	-9	-8	-5	-4	-1	-1	-1	-1	-1	-1	1	3	4	2	-14	
	1000	-10	-11	-8	-9	-8	-6	-4	-1	-1	-1	-1	-1	-1	1	3	4	2	-17	
	1250	-10	-11	-10	-9	-8	-7	-4	-1	-1	-1	-1	-1	-1	1	3	4	4	-16	
	1600	-10	-13	-10	-7	-8	-6	-5	-2	-1	-1	-1	-1	-1	0	4	6	1	-20	
	2000	-8	-12	-10	-7	-7	-7	-5	-2	-1	-1	-1	-1	-1	0	3	3	2	-23	
	2500	-7	-11	-10	-7	-7	-5	-1	-1	-1	-1	-1	-1	-1	0	2	3	1	-21	
	3150	-7	-10	-11	-8	-7	-6	-5	-0	-2	-1	-1	-1	-1	1	5	3	2	-23	
	4000	-5	-8	-11	-7	-6	-3	-4	-1	-3	0	1	0	1	1	1	1	1	-27	
	5000	2	-3	-6	-1	-3	-1	-0	0	0	2	3	1	1	0	-4	-6	-19	-29	
	6300	4	-0	-3	0	-1	3	1	0	1	0	2	1	-1	-2	-6	-13	-21	-33	
	8000	-1	-6	-5	-4	-5	-2	-1	0	2	1	2	4	2	1	-3	-11	-18	-27	
	10000	-1	-5	-5	-4	-4	-1	-1	1	1	1	1	1	1	-1	-5	-13	-20	-32	
OCTAVE	31.5	-5	-6	-6	-7	-9	-7	-6	-4	-4	-3	-2	-1	-2	1	3	5	5	2	
	63	-4	-6	-9	-7	-11	-12	-11	-9	-7	-6	-6	-5	-4	-2	2	4	7	-13	
	125	-11	-12	-8	-10	-11	-5	-6	-4	-4	-3	-3	-1	-1	1	5	6	4	-19	
	250	-8	-7	-5	-9	-11	-3	-3	-1	-1	-1	-1	-1	-1	3	5	8	1	-17	
	500	-7	-5	-6	-9	-10	-11	-11	-9	-7	-6	-6	-5	-3	1	5	3	1	-19	
	1000	-9	-10	-8	-9	-8	-6	-4	-1	-1	-1	-1	-1	-1	0	2	3	2	-23	
	2000	-9	-12	-10	-7	-8	-7	-5	-2	-1	-1	-1	-1	-1	0	3	4	2	-27	
	4000	-2	-6	-8	-4	-1	-2	-2	1	0	1	0	2	1	0	-1	-5	-17	-30	
	8000	3	-1	-4	-1	-2	-2	-1	0	1	0	1	0	2	0	-1	-5	-12	-28	
OVERALL	-7	-8	-8	-8	-9	-9	-5	-4	-2	-2	-1	0	1	3	4	5	0	-9	-18	

FIGURE: NORMALIZED FARFIELD NOISE LEVELS

3 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

1 = 31.5 Hz

2 = 63 Hz

3 = 125 Hz

4 = 250 Hz

5 = 500 Hz

6 = 1000 Hz

7 = 2000 Hz

8 = 4000 Hz

9 = 8000 Hz

10 = 16000 Hz

IDENTIFICATION

OMEGA 1.4

TEST 75-02-046

RUN 01

OPERATION

IDLE POWER

37% RPM

BOTH ENGINES

FREE FLOW

15 C

BAR PRESS = 760 M HG

REL HUMID = 70 %

09 MAY 75

PAGE 6

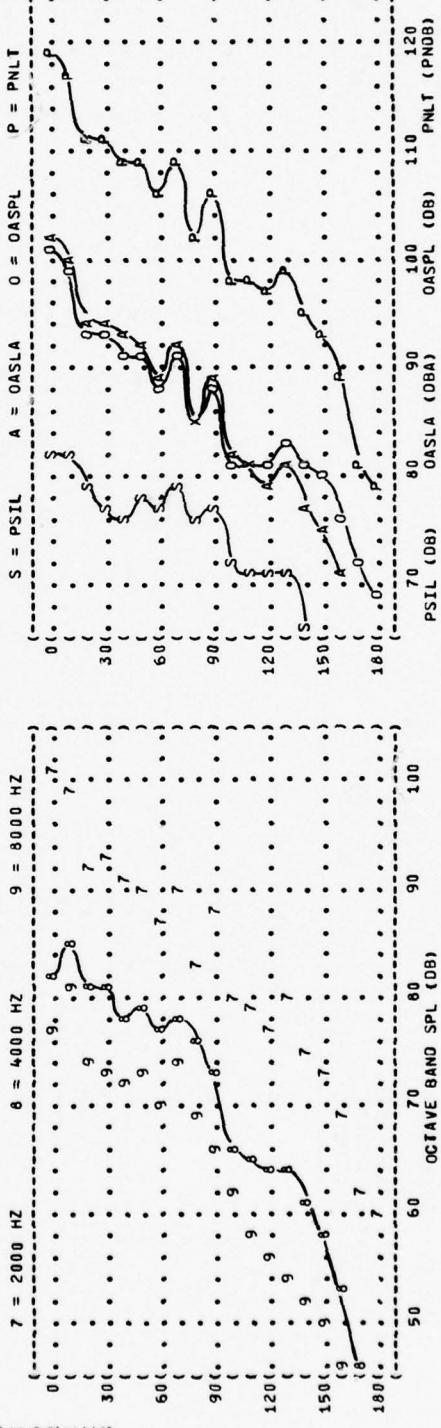
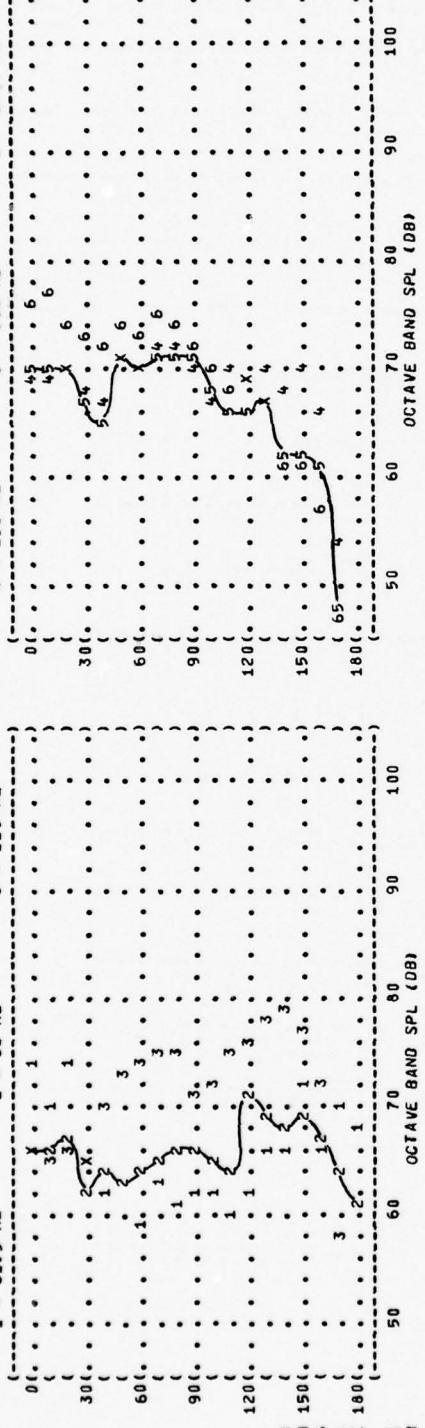


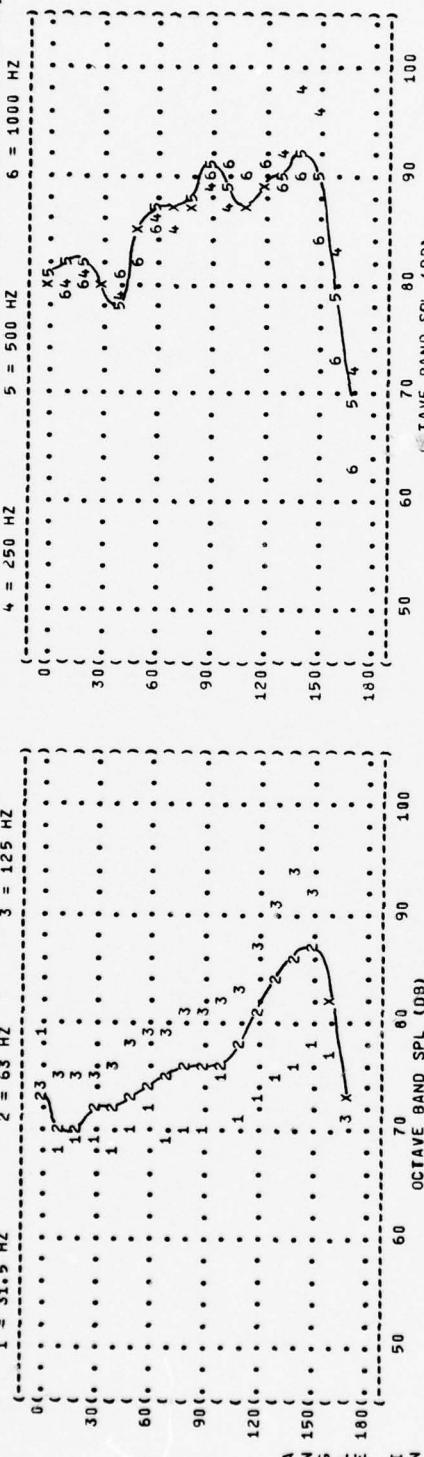
FIGURE: NORMALIZED FARFIELD NOISE LEVELS

3 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

1 = 31.5 Hz 2 = 63 Hz 3 = 125 Hz



7 = 2000 Hz 8 = 4000 Hz 9 = 8000 Hz

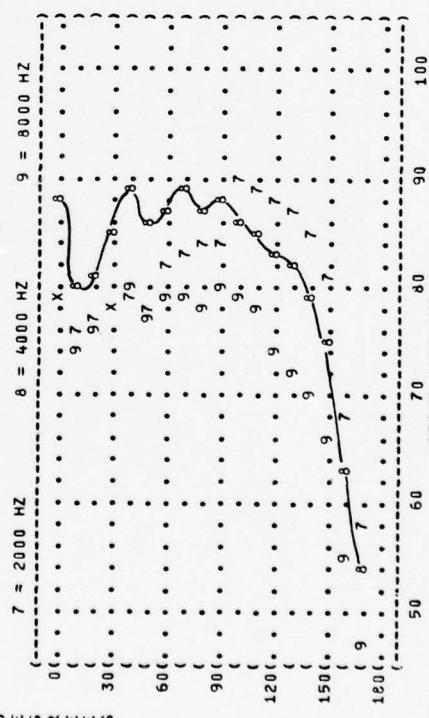
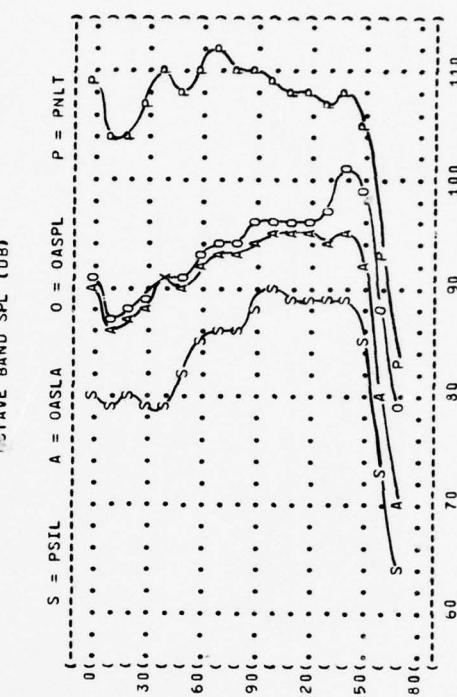
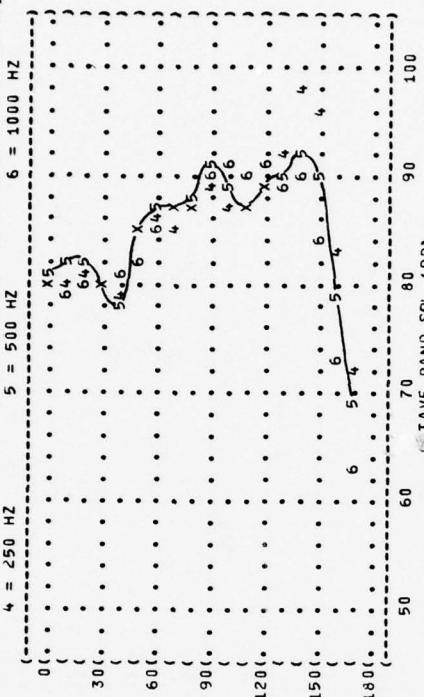


FIGURE: IDENTIFICATION

OPERATION:

TRIM CHECK POWER
92% RPM
BOTH ENGINES
FREE FLOW

1 = 31.5 Hz 2 = 63 Hz 3 = 125 Hz

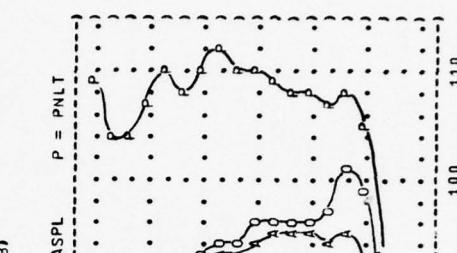
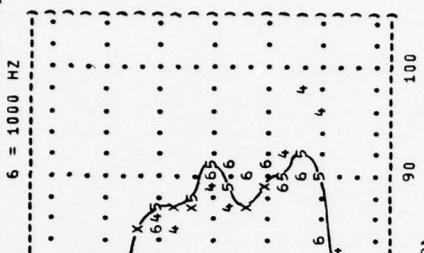


METEOROLOGY:

TEMP = 15 C

BAR PRESS = 760 M HG
REL HUMID 70 %

1 = 31.5 Hz 2 = 63 Hz 3 = 125 Hz

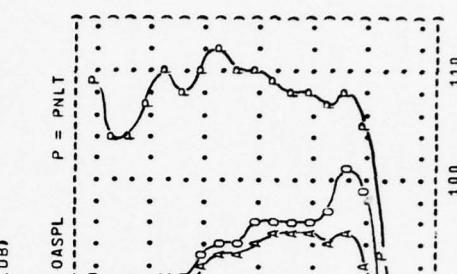
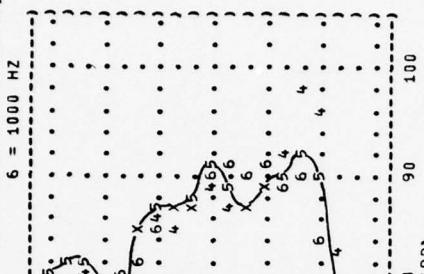


TEST 75-002-046

RUN 02

09 MAY 75

PAGE 6



OMEGA 1.4

TEST 75-002-046

RUN 02

09 MAY 75

PAGE 6

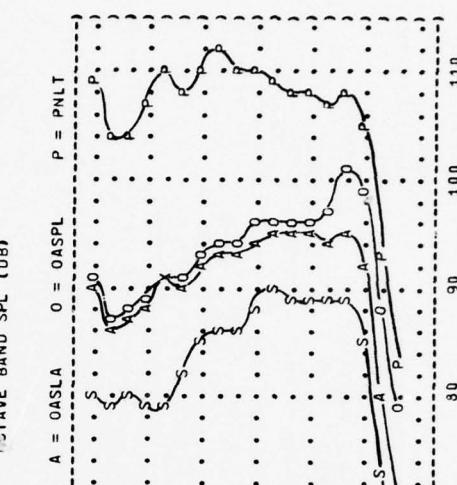
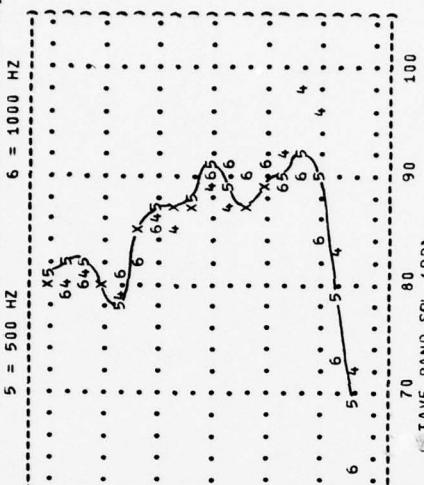


FIGURE 1 NORMALIZED FARFIELD NOISE LEVELS

3 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

1 = 31.5 Hz

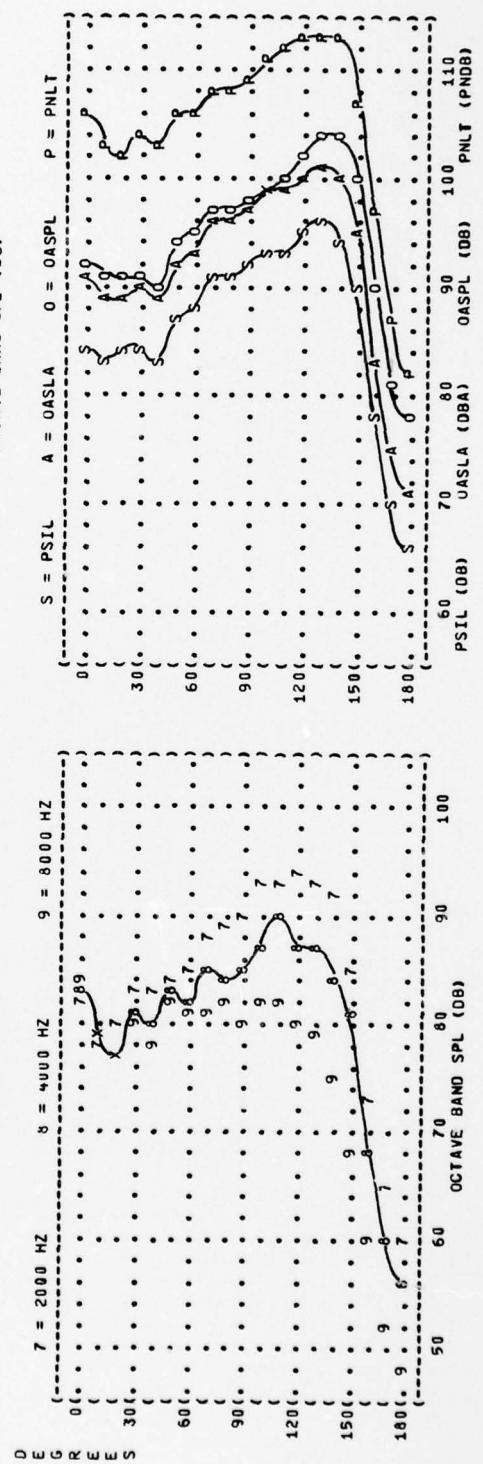
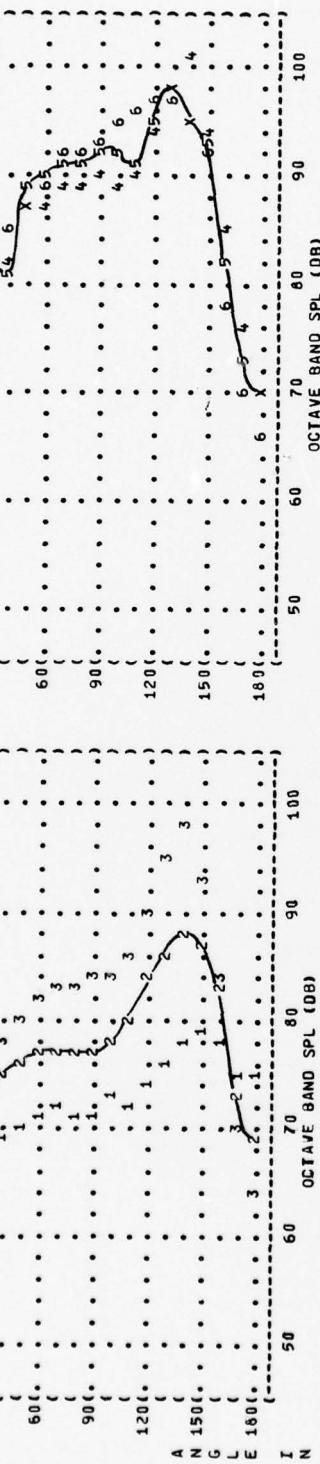
2 = 63 Hz

3 = 125 Hz

4 = 250 Hz

5 = 500 Hz

6 = 1000 Hz



S = PSIL A = OASLA O = OASPL P = PNLT

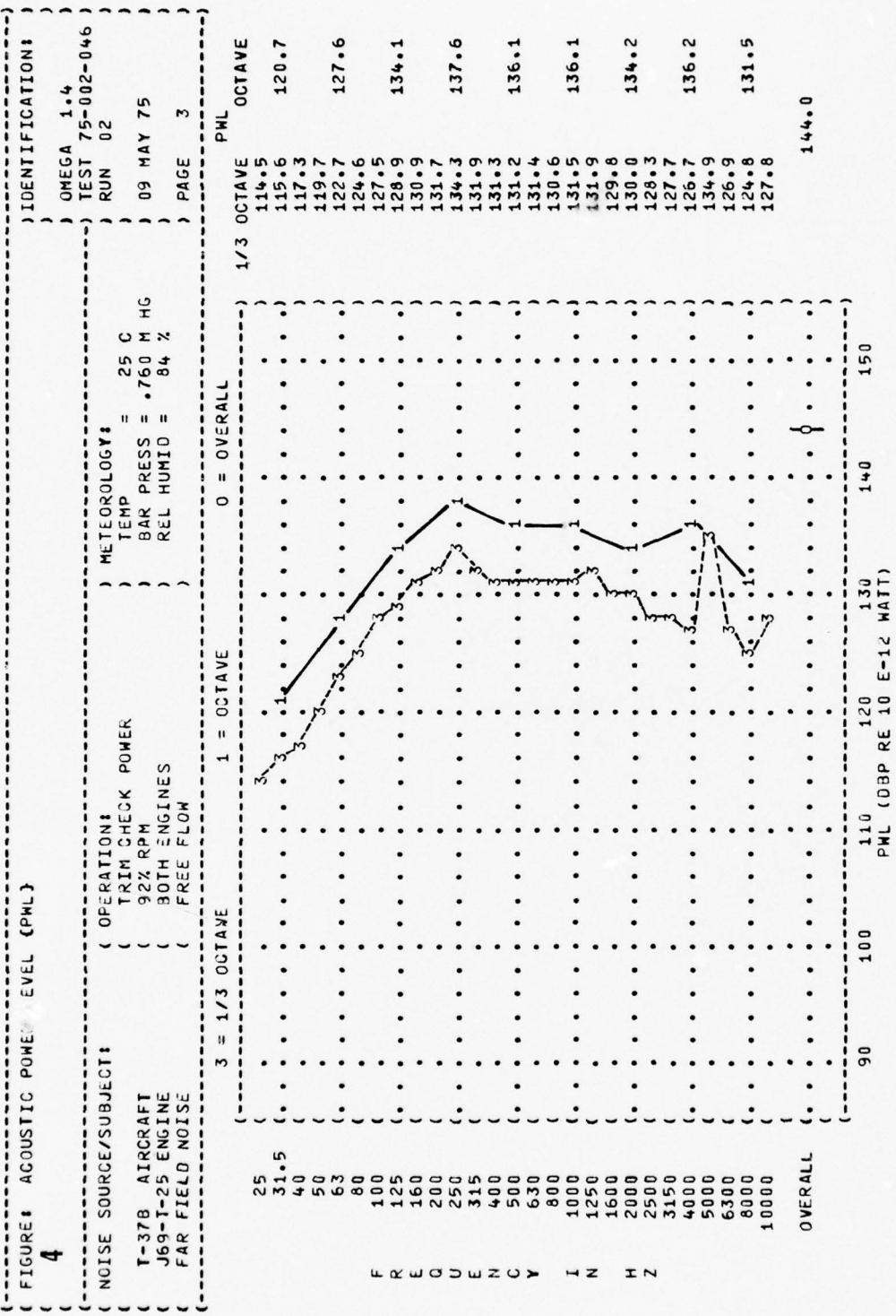
TEST 75-002-046

RUN 03

09 MAY 75

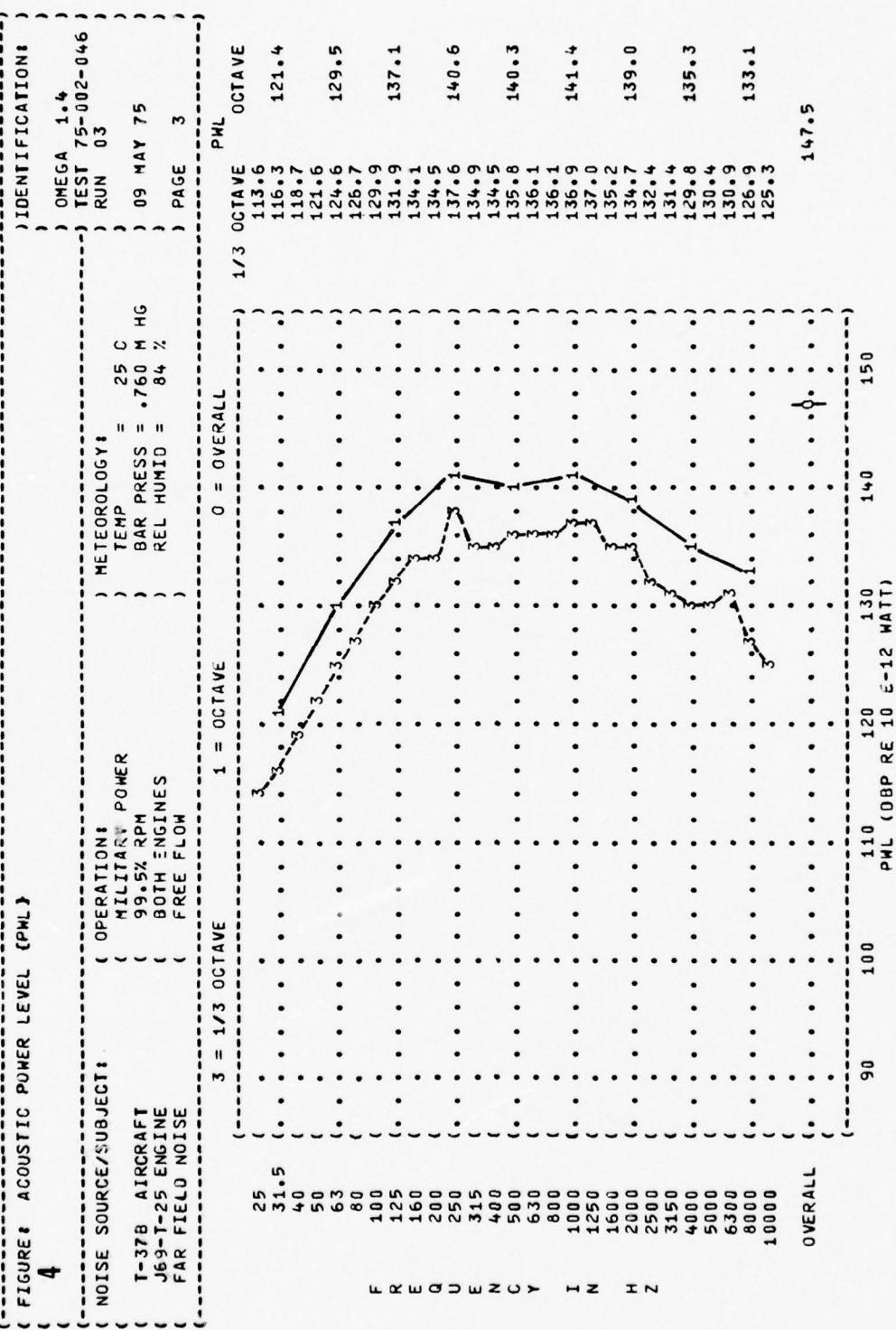
PAGE 6

FIGURE 8. ACOUSTIC POWER LEVEL (PWL).



{ FIGURE 4 ACOUSTIC POWER LEVEL (PWL) }

4



T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

METEOROLOGY:

TEMP = 25 C

BAR PRESS = .760 H HG

REL HUMID = 84 %

PAGE 3

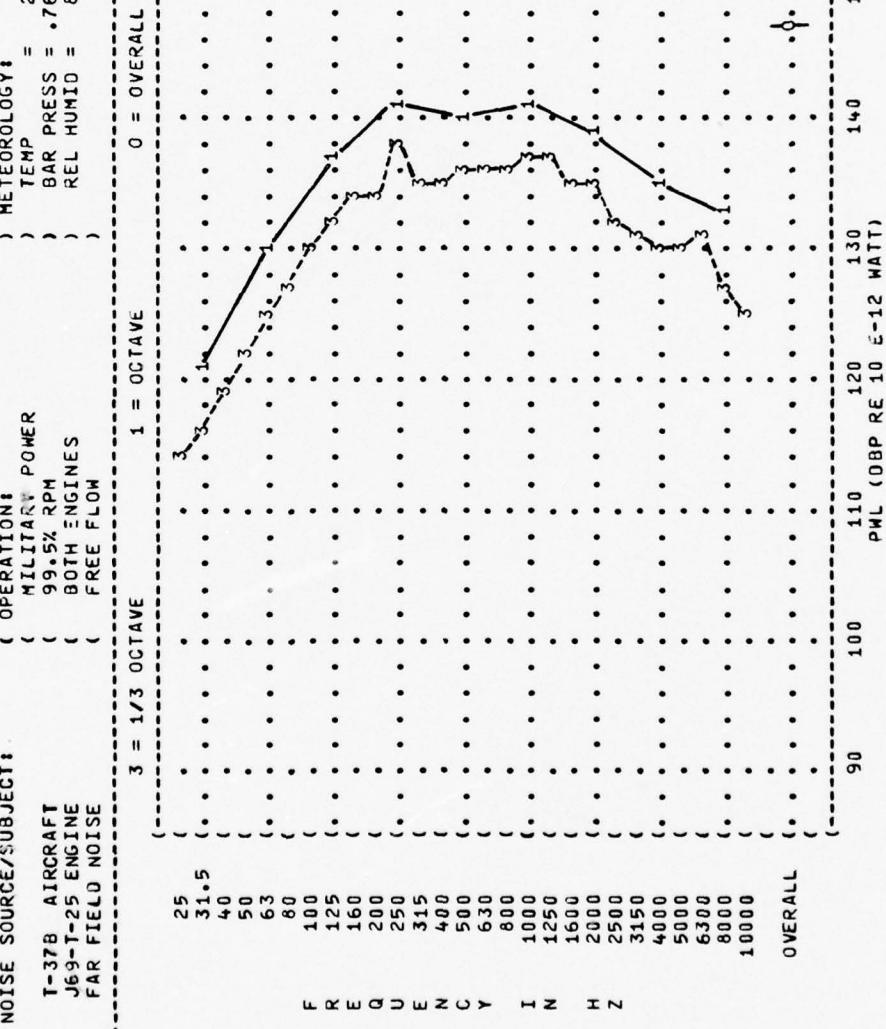


FIGURE 5
EQUAL LEVEL CONTOURS (DB)

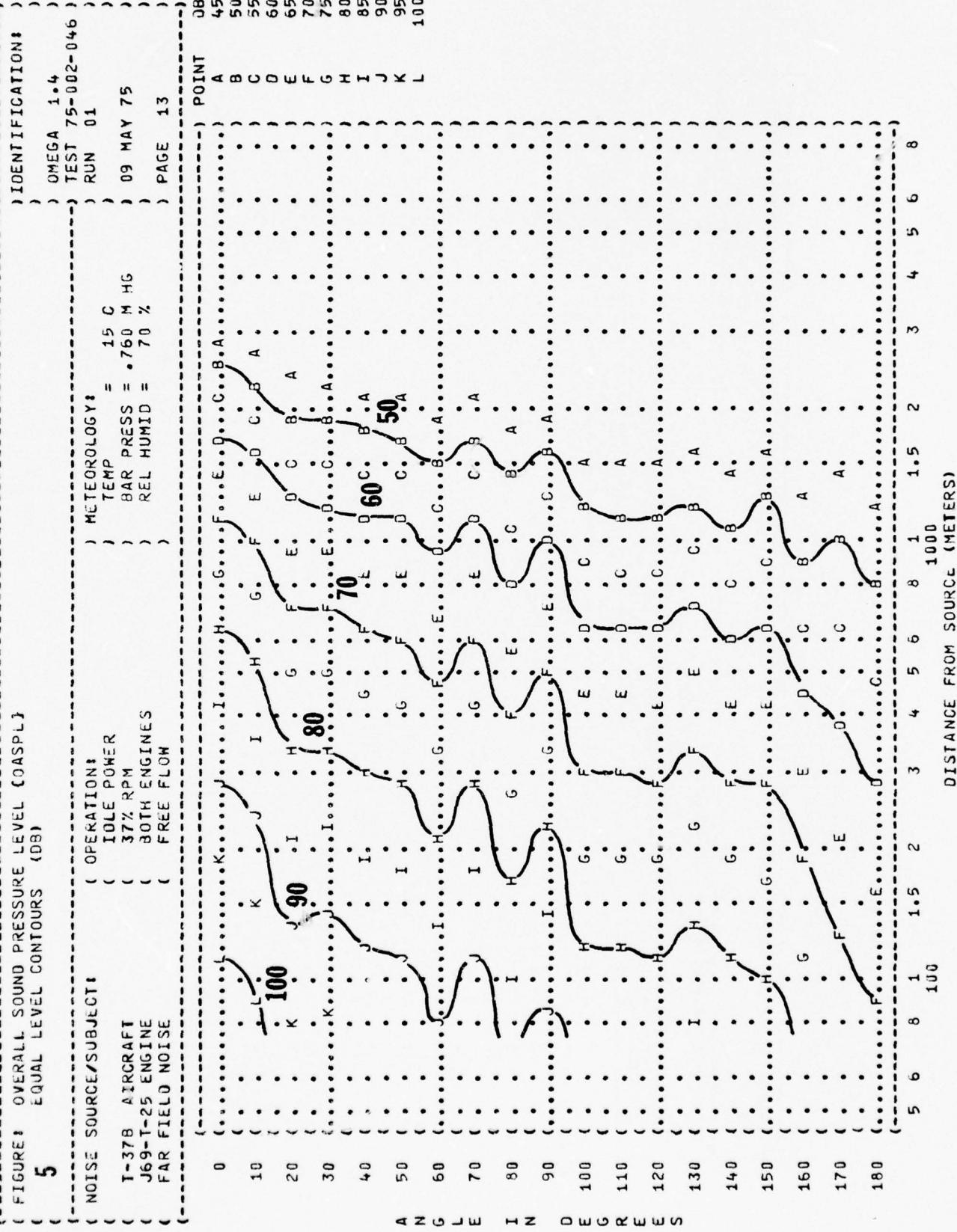
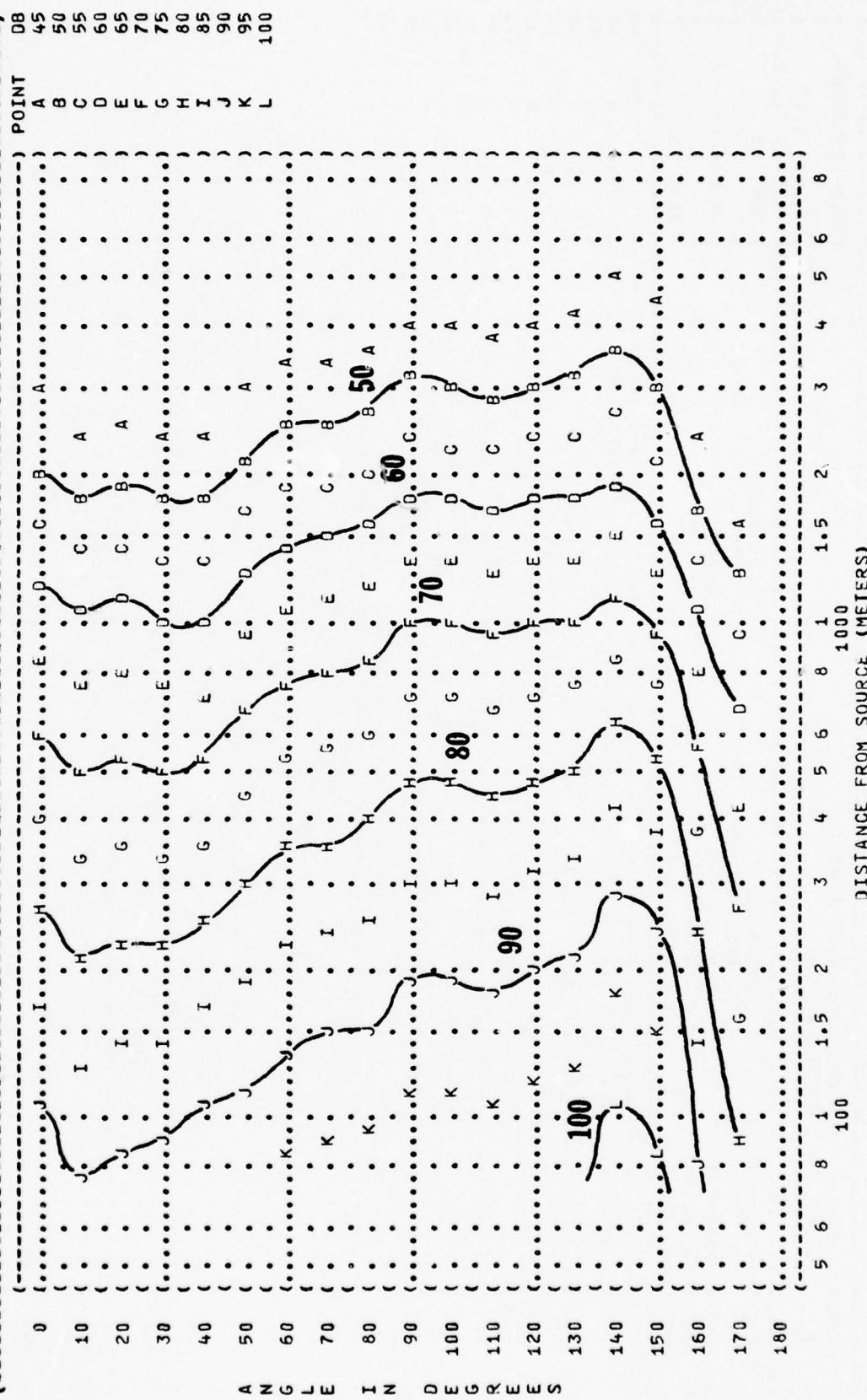


FIGURE 5 OVERALL SOUND PRESSURE LEVEL (OASPL)
EQUAL LEVEL CONTOURS (dB)

FIGURE: OVERALL SOUND PRESSURE LEVEL (0 ASPL)
 EQUAL LEVEL CONTOURS (DB) 5
 NOISE SOURCE/SUBJECT: T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE
 OPERATION: TRIM CHECK POWER
 92% RPM
 BOTH ENGINES
 FREE FLOW
 METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = 760 M HG
 REL HUMID = 70 %
 TEST 75-002-046
 OMEGA 1.4
 RUN 02
 09 MAY 75
 PAGE 13

TEST 75-002-046
) RUN 02
) 09 MAY 75
) PAGE 13
 NOISE SOURCE/SUBJECT: T-37B AIRCRAFT J69-T-25 ENGINE FAR FIELD NOISE
) OPERATION:
) TRIM CHECK POWER
) 92% RPM
) BOTH ENGINES
) FREE FLOW
) METEOROLOGY:
) TEMP = 15 C
) BAR PRESS = .760 M HG
) REL HUMID = 70 %
)



(FIGURE 5
OVERALL SOUND PRESSURE LEVEL (OASPL)
EQUAL LEVEL CONTOURS (DB)

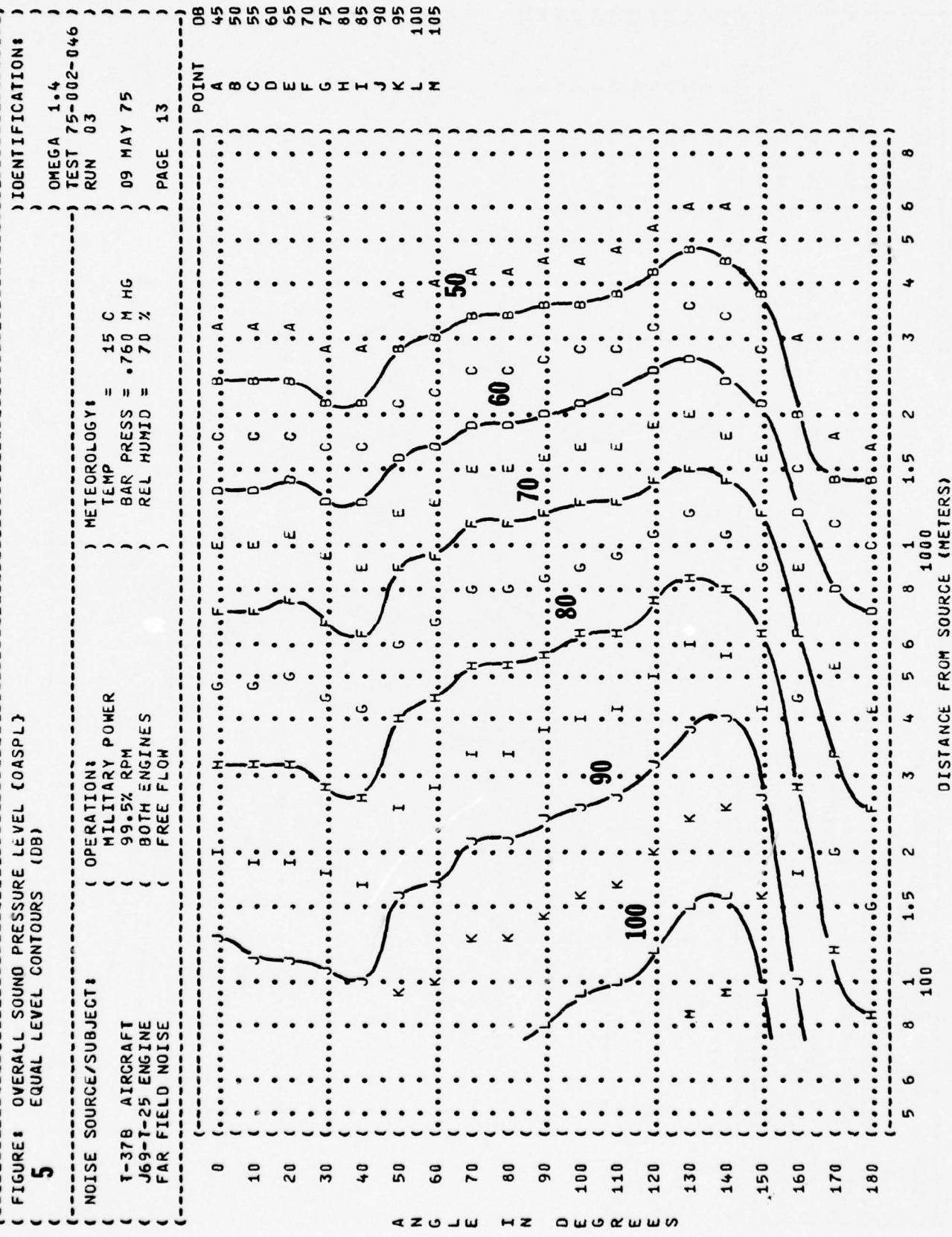
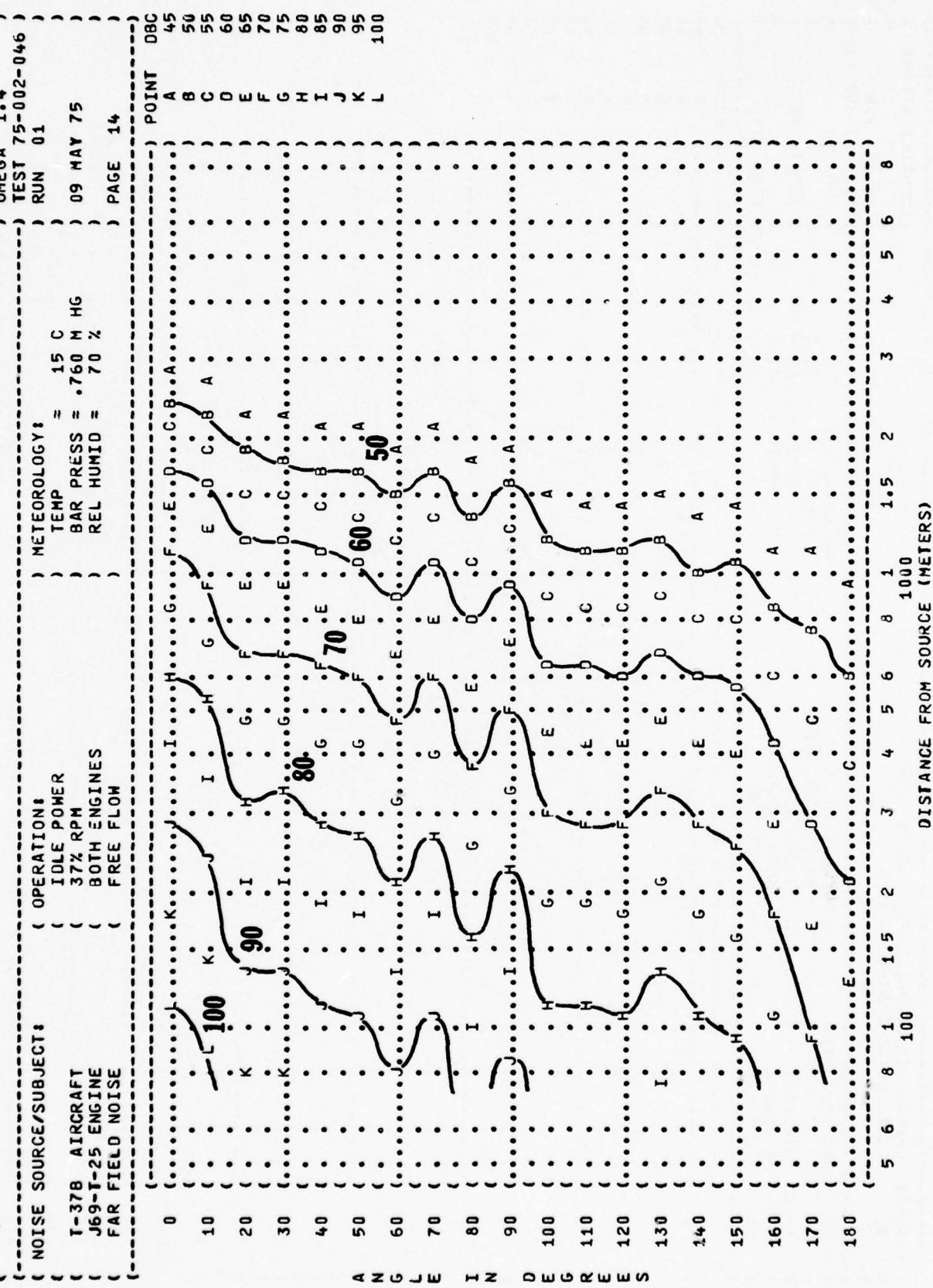


FIGURE 6
C-WEIGHTED OVERALL SOUND LEVEL (OASLC)
EQUAL LEVEL CONTOURS (DBC)



{ FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (OASLC)
6 EQUAL LEVEL CONTOURS (DBC)

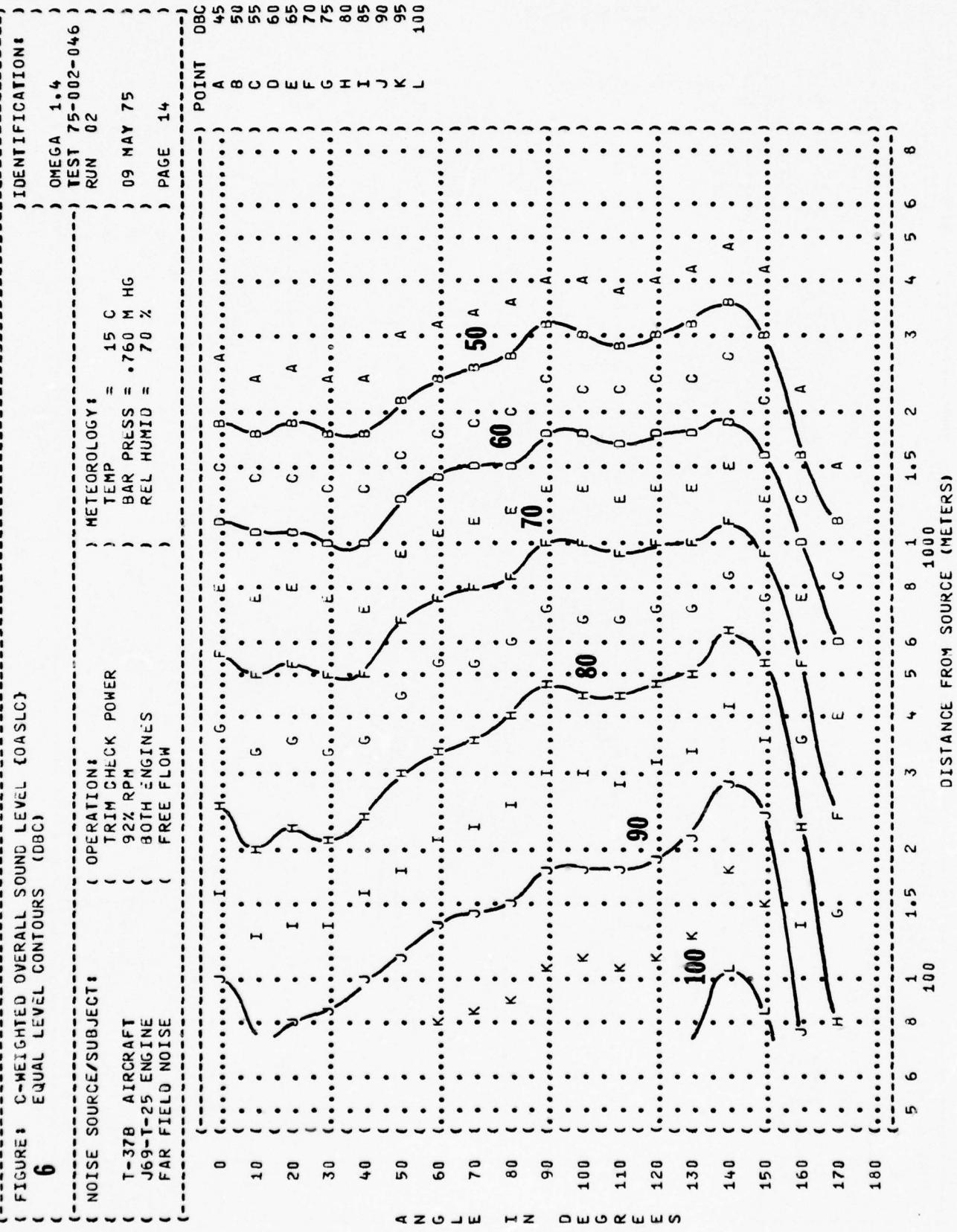


FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (DBC)
6
 EQUAL LEVEL CONTOURS (DBC)

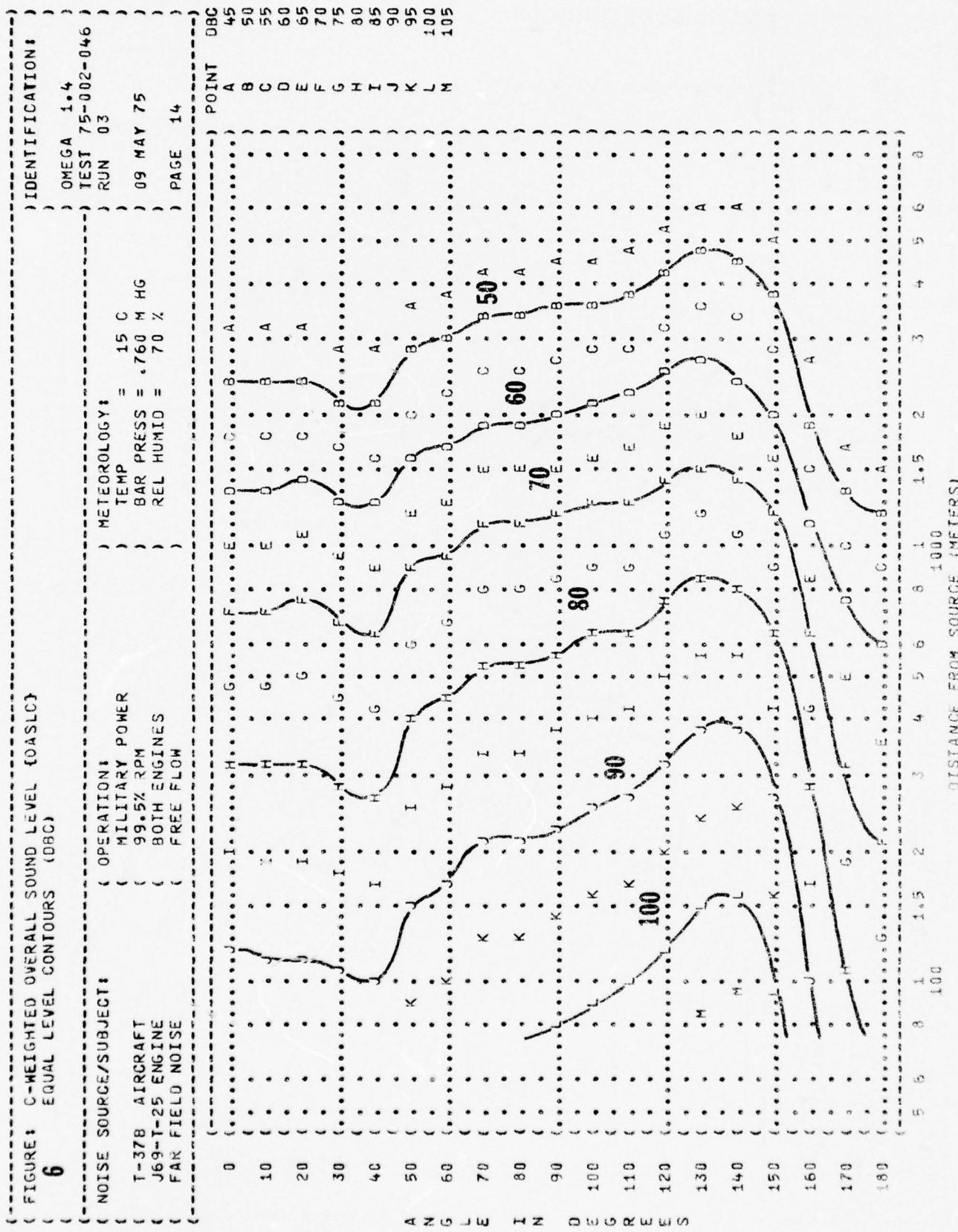


FIGURE 7 EQUAL LEVEL CONTOURS (DBA)

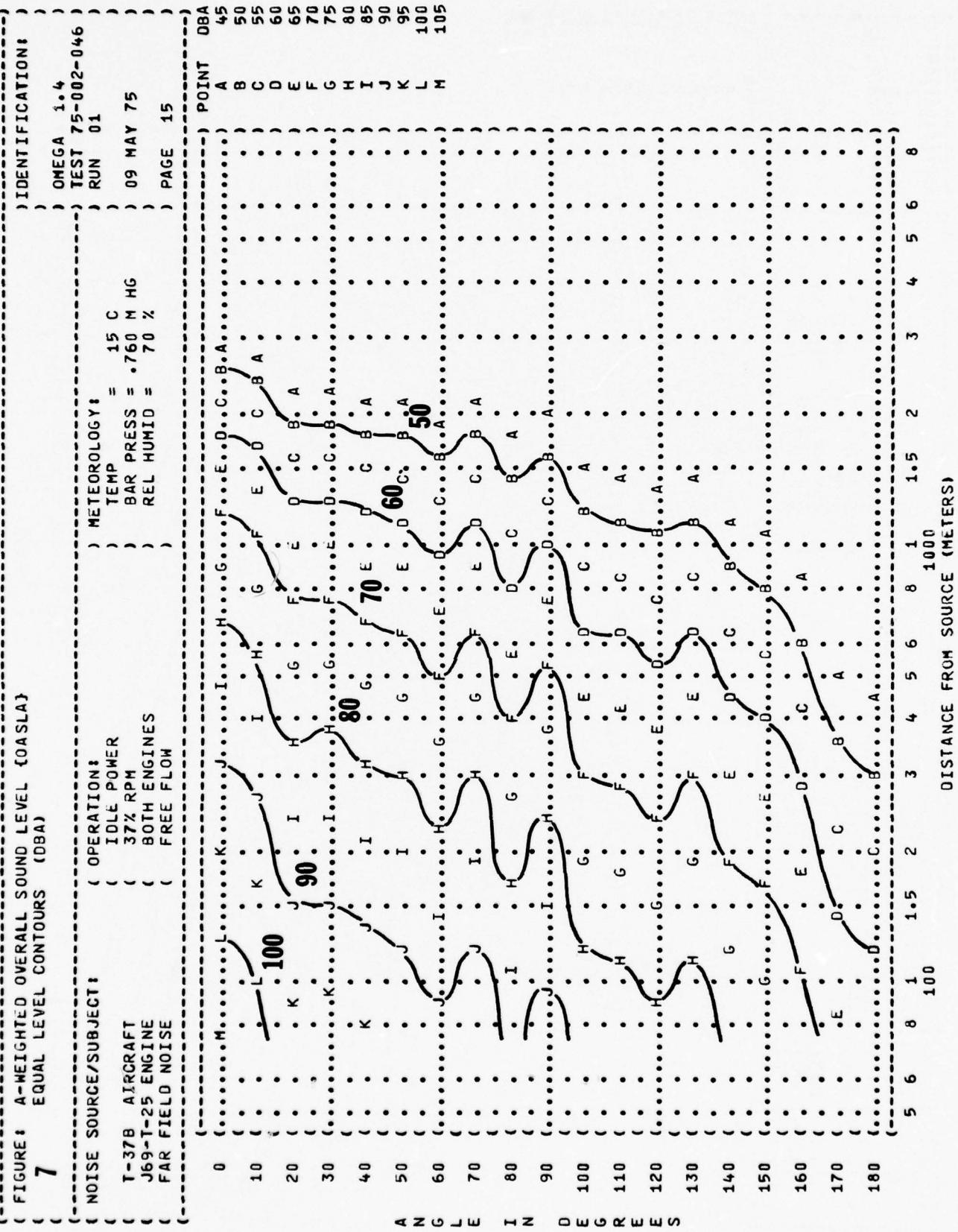


FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (DBA)
7 EQUAL LEVEL CONTOURS (DBA)

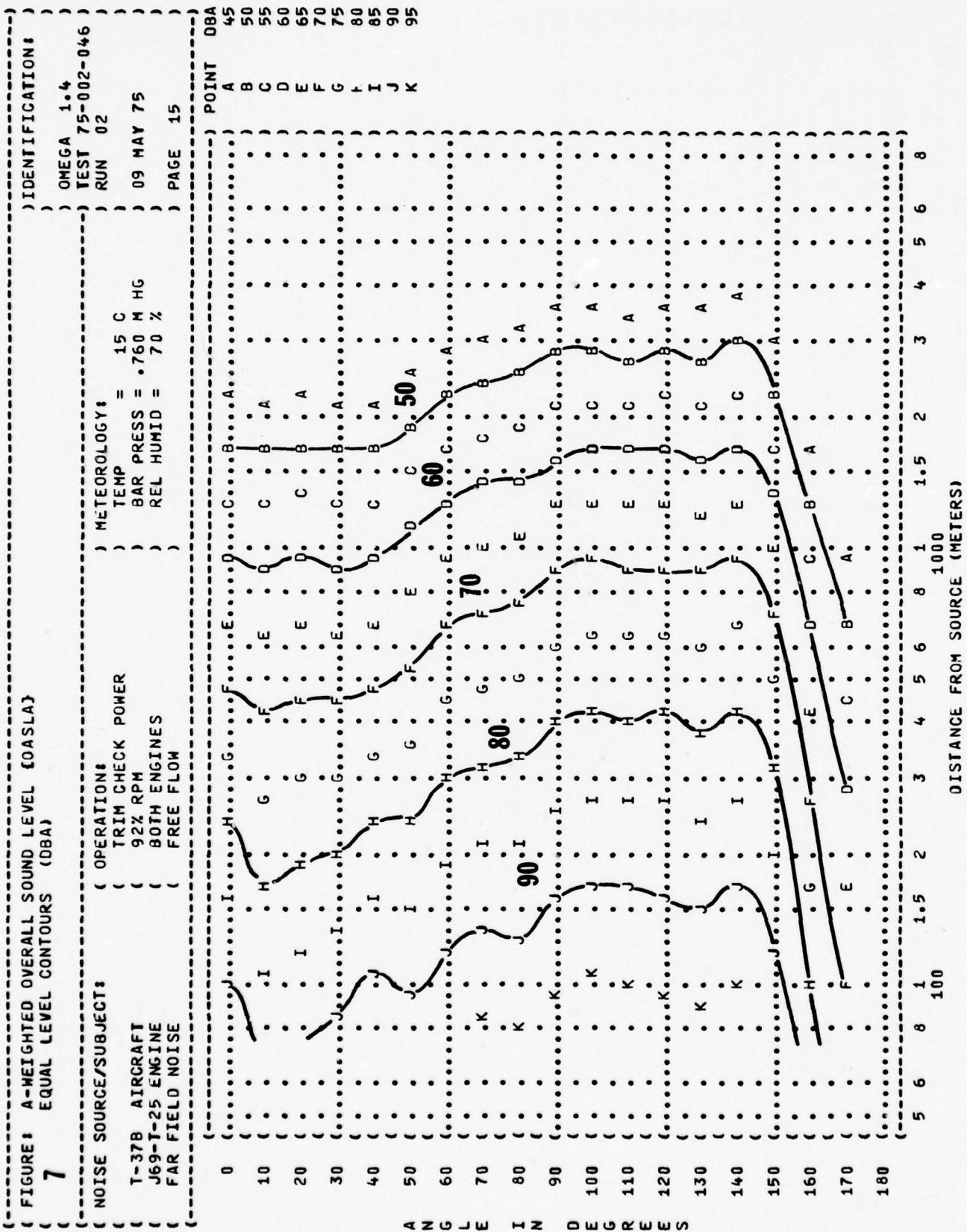


FIGURE 1 A-WEIGHTED OVERALL SOUND LEVEL (DBA)
EQUAL LEVEL CONTOURS

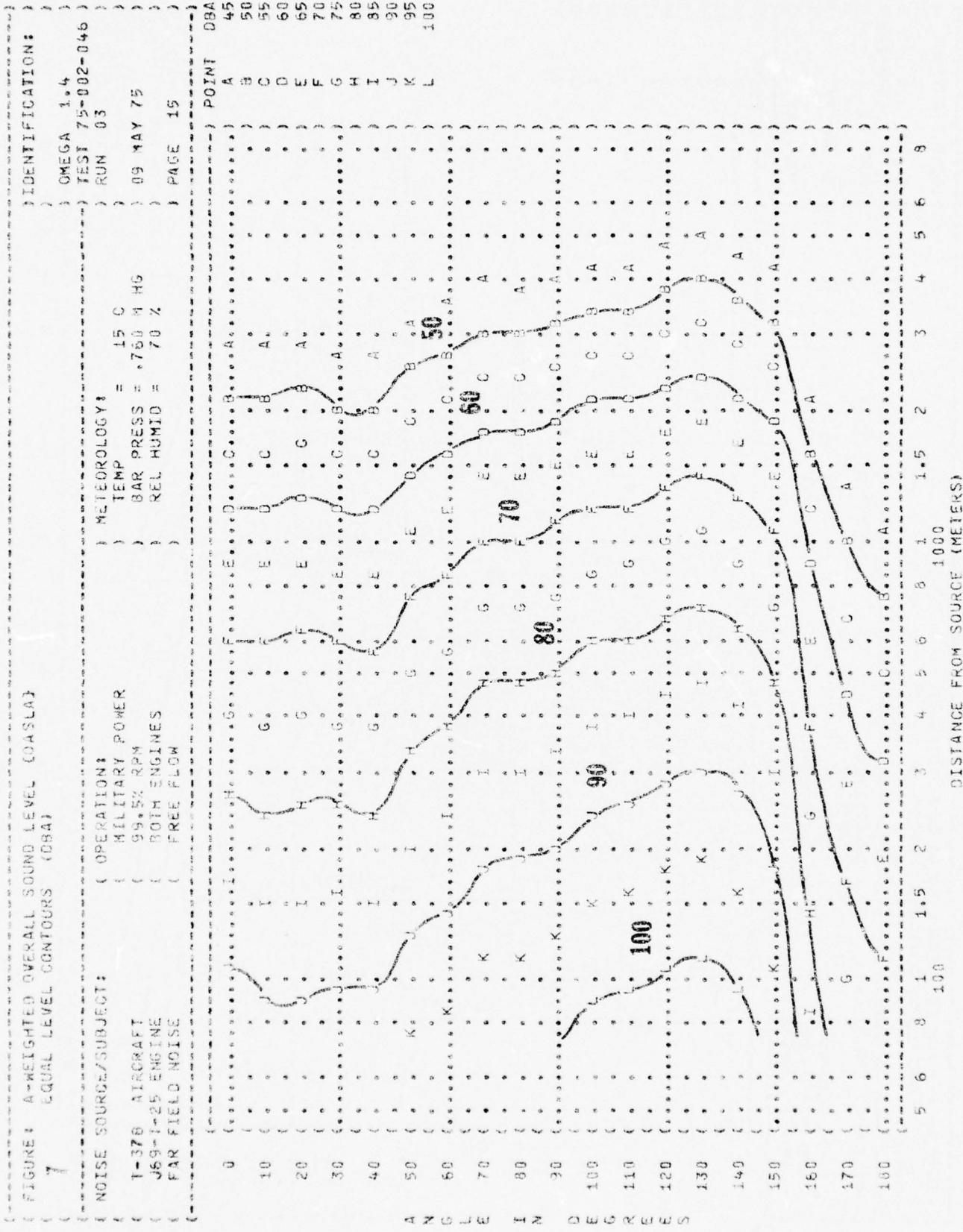


FIGURE 8
EQUAL LEVEL CONTOURS (PNL)
WITH SMOOTH TONE CORRECTION (PNLT)

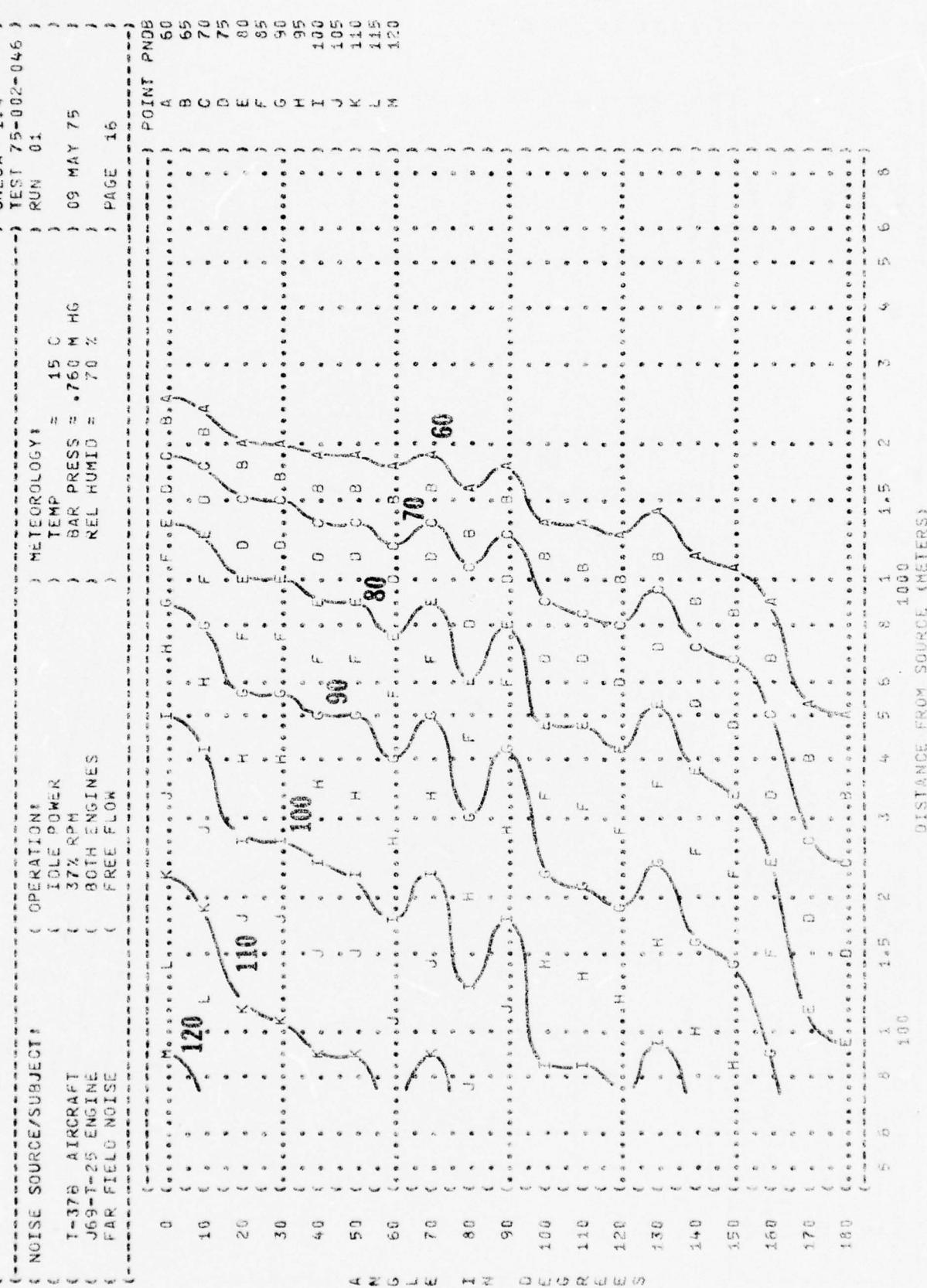


FIGURE: PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION (PNLT)
EQUAL LEVEL CONTOURS (PNDB)

8

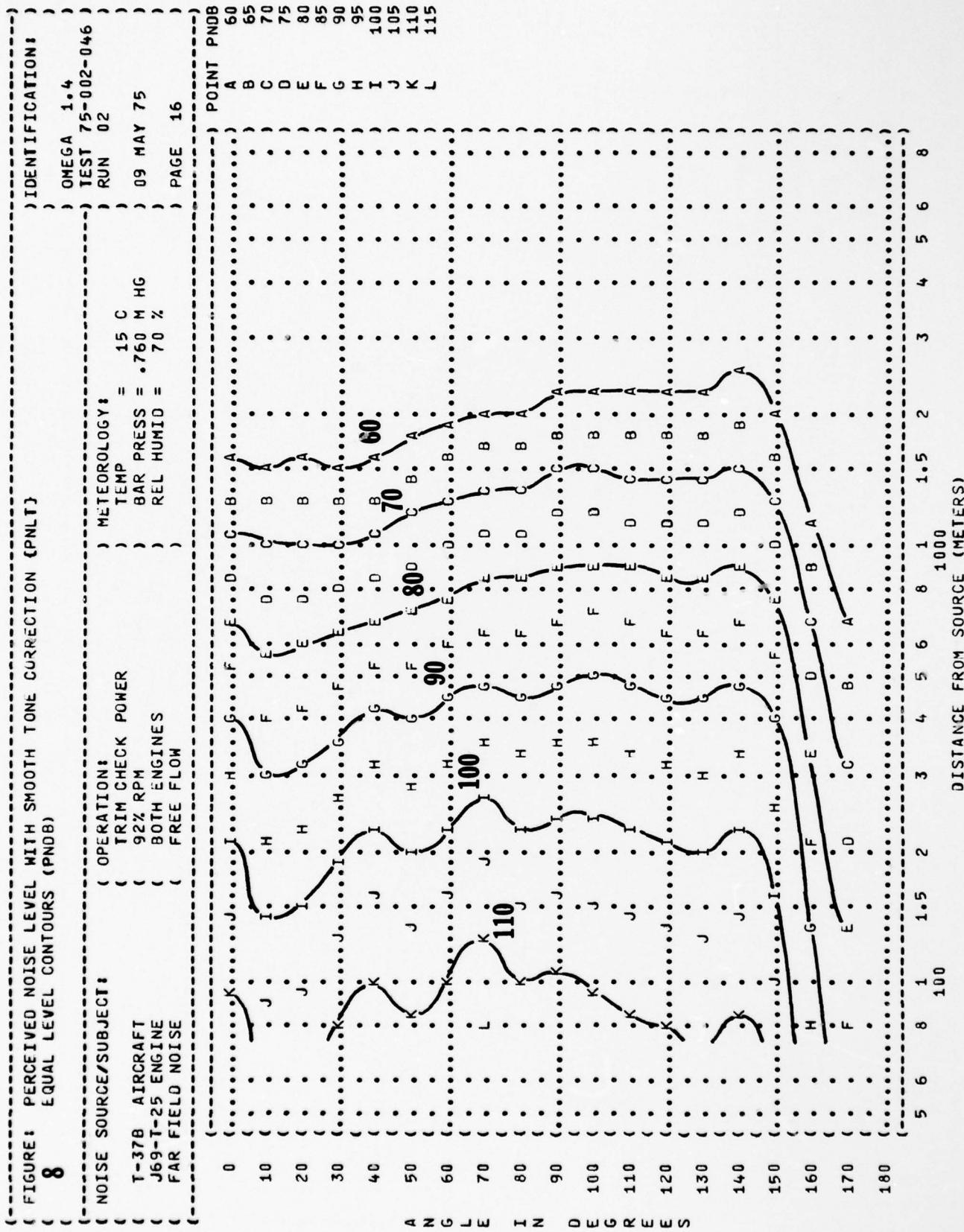


FIGURE 8 PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION (PNLT) EQUAL LEVEL CONTOURS (PN0B)

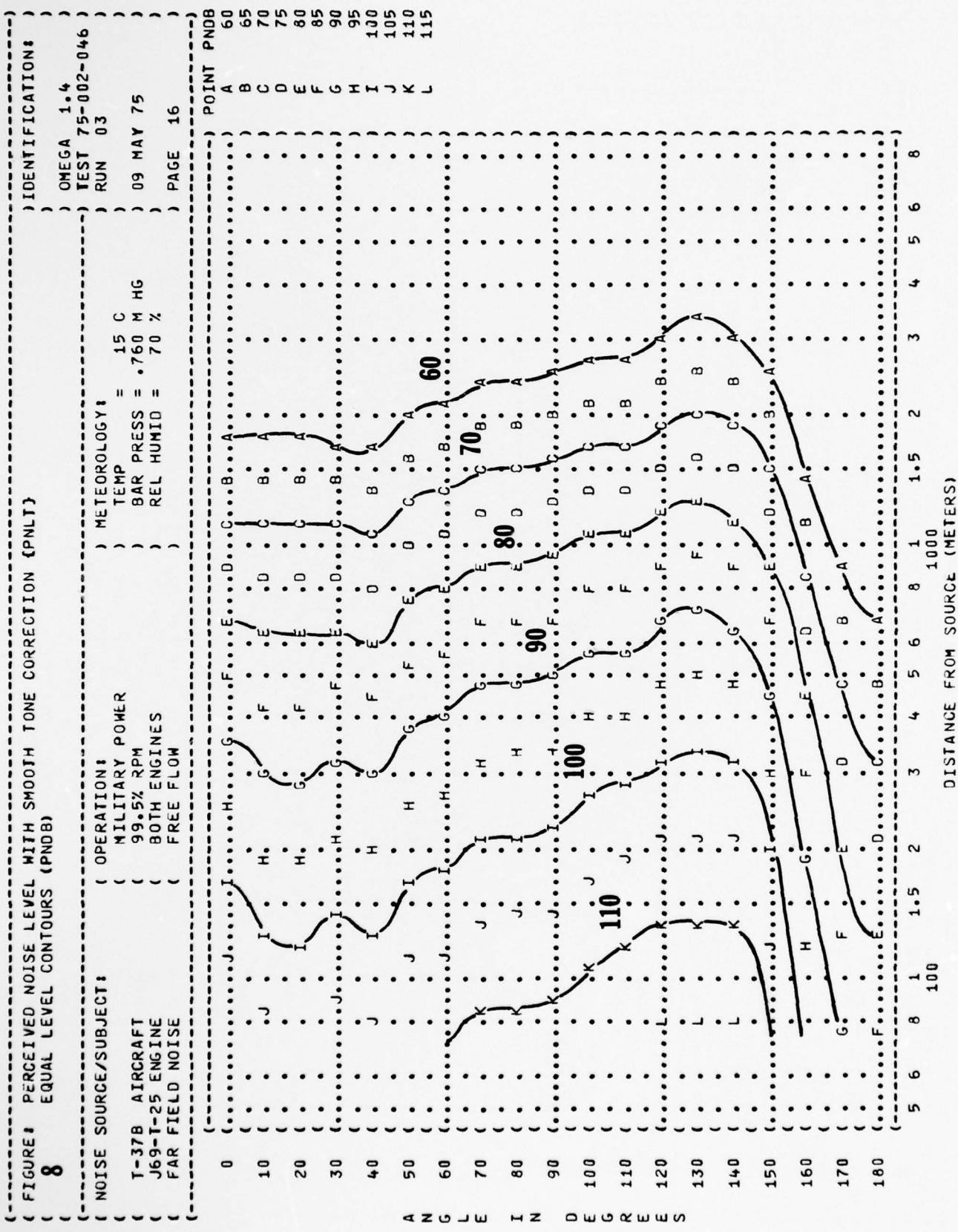


FIGURE 9 PREFERRED SPEECH INTERFERENCE LEVEL (PSIL)
EQUAL LEVEL CONTOURS (dB)

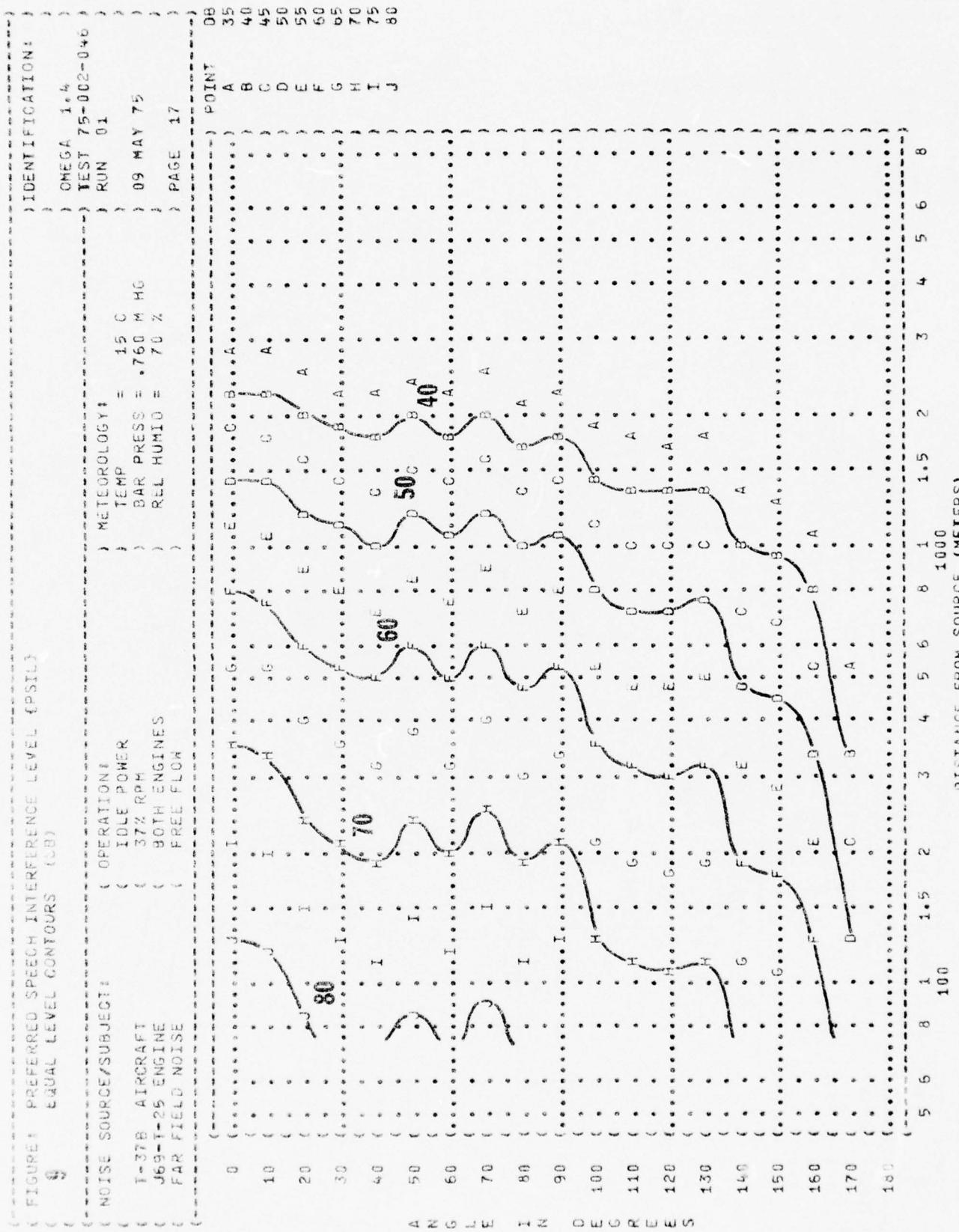


FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL)
9
 EQUAL LEVEL CONTOURS (DB)

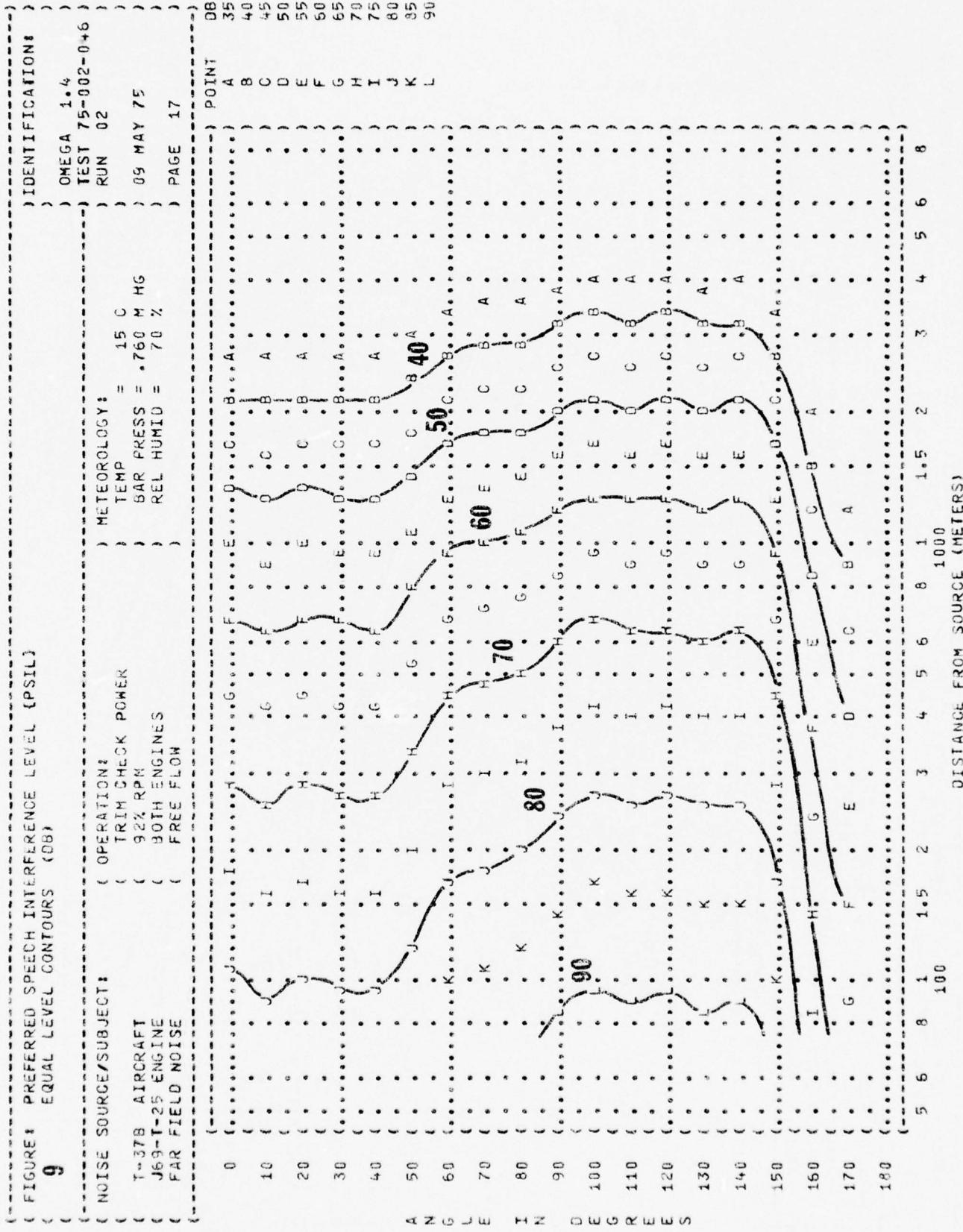


FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL)
9
 EQUAL LEVEL CONTOURS (DB)

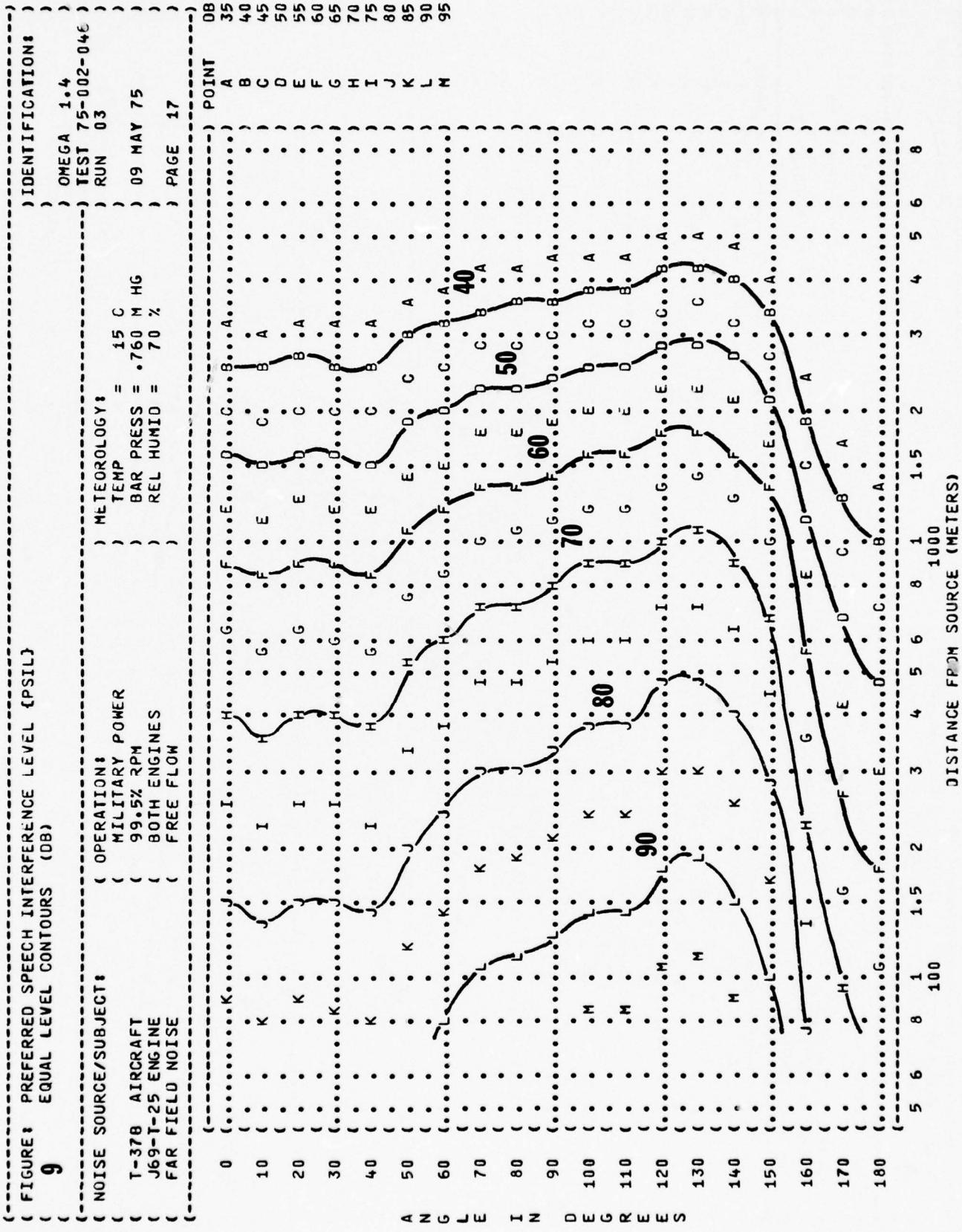


FIGURE: MAXIMUM PERMISSIBLE TIME (CT) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)
 EQUAL TIME CONTOURS (MINUTES)
10
 NO PROTECTION
 T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

IDENTIFICATION:
OMEGA 1.4

TEST 75-002-046
RUN 01

NOISE SOURCE/SUBJECT:
 OPERATIONS:
 IDLE POWER
 37% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 PAGE 7

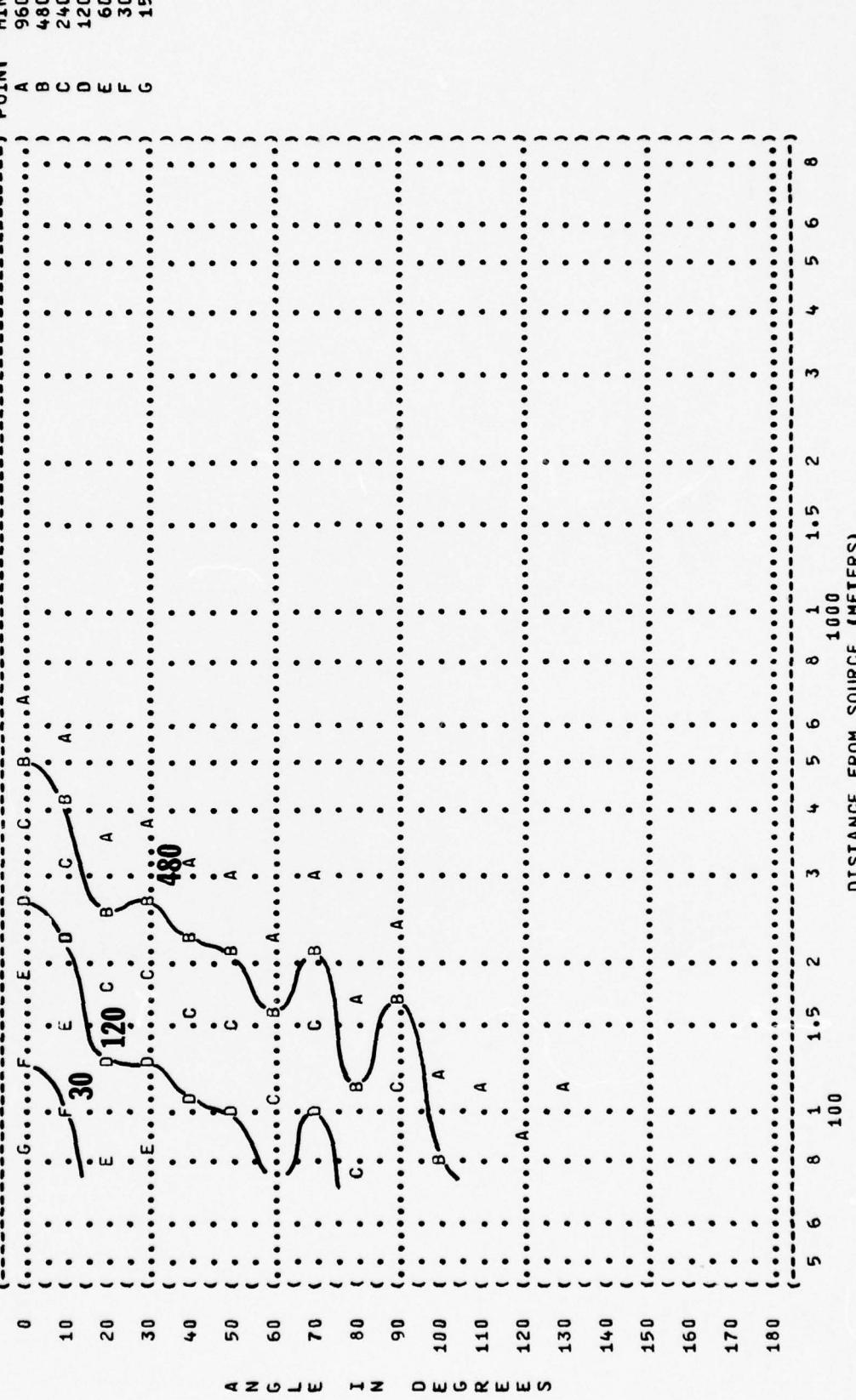


FIGURE : MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)) IDENTIFICATION:
 10 EQUAL TIME CONTOURS (MINUTES))
 T-37B AIRCRAFT) OMEGA 1.4
 J69-T-25 ENGINE) TEST 75-002-046
 FAR FIELD NOISE) RUN 01
)
 NOISE SOURCE/SUBJECT: { OPERATION!
) IDLE POWER) METEOROLOGY:
) 37% RPM) TEMP = 15 C
) BOTH ENGINES) BAR PRESS = .760 M HG
) FREE FLOW) REL HUMID = 70 %
)
) PAGE 8

PERSONNEL MAY BE EXPOSED UP TO 960 MINUTES PER DAY
AT ALL DISTANCES FROM SOURCE EQUAL TO OR GREATER THAN 75 METERS
FOR ALL ANGLES INDICATED ON ATTACHED FIGURE

FINDING TWO FOLLOWING WAS DEDUCTORIALLY
FOR ALL ANGLES EVALUATED (INDICATED BY < AT LEFT)

UNDER THE FOLLOWING EAR PROTEILLION CONDITIONS:

THE JOURNAL OF CLIMATE

AMERICAN OPTICAL 1300 EAST WINGATE

AMERICAN OPTICAL INSTITUTE

V-512 EAR PT W/S

卷之三

COMMIT TRIPLE CHARGE EAR PLUGS

卷之三

H-133 GROUND COMMUNICATION UNIT

卷之三

卷之三

卷之三

DISTANCE FROM SOURCE METERS 1000

FIGURE 1. MAXIMUM PERMISSIBLE TIME (LT) FOR EQUAL TIME CONTOURS (MINUTES) NO PROTECTION

FIGURE 1. MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)

3 IDENTIFICATION:

3 OMEGA 1.04

) TEST 75-002-046)
) RUN 02)

109 MAX 75

2328

1 PAGE 3

MIN 960

480 240

120 60

100

104

200

200

卷之三

100

104

100

100

200

卷之三

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• •

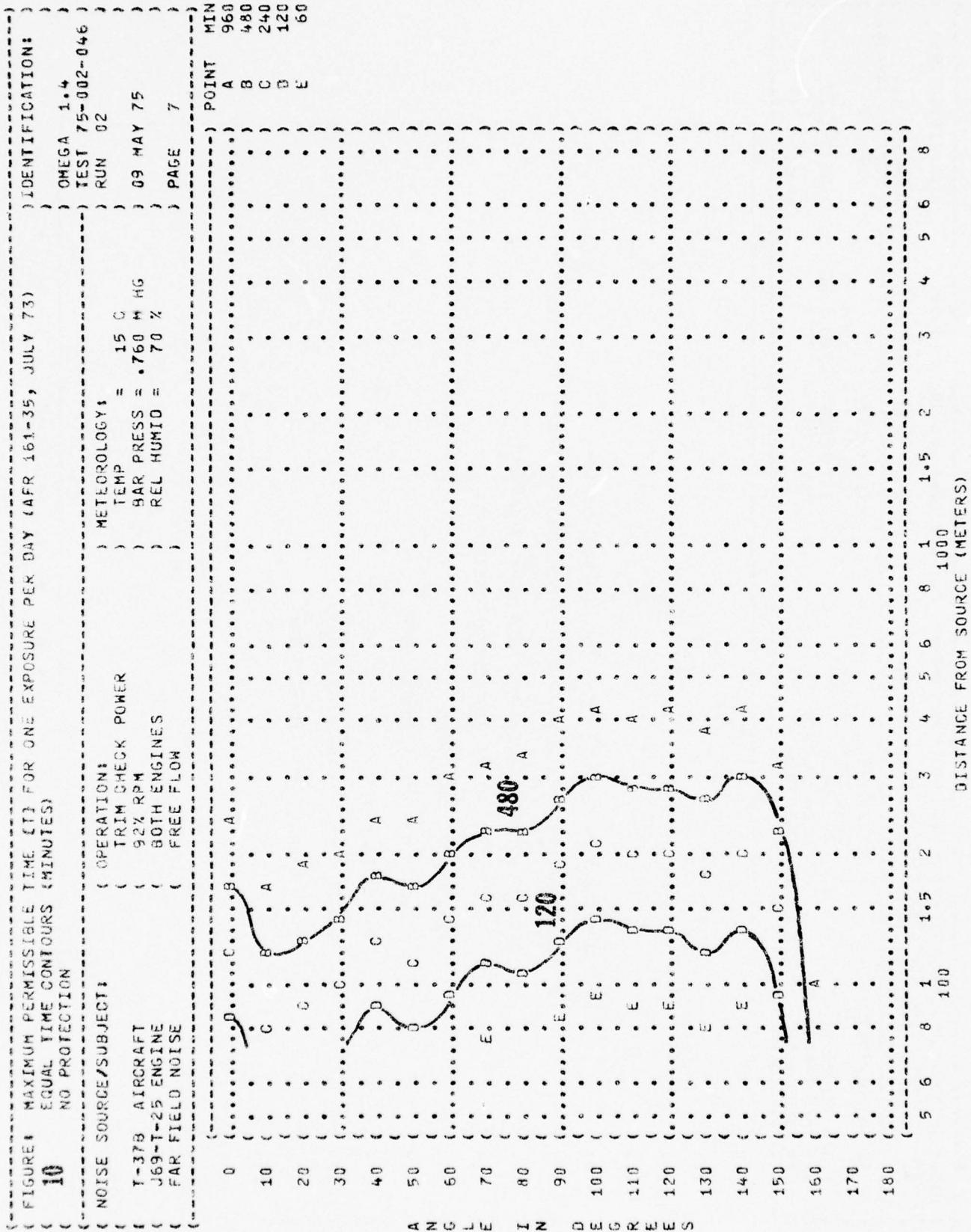
160

200

• •

100

6 8



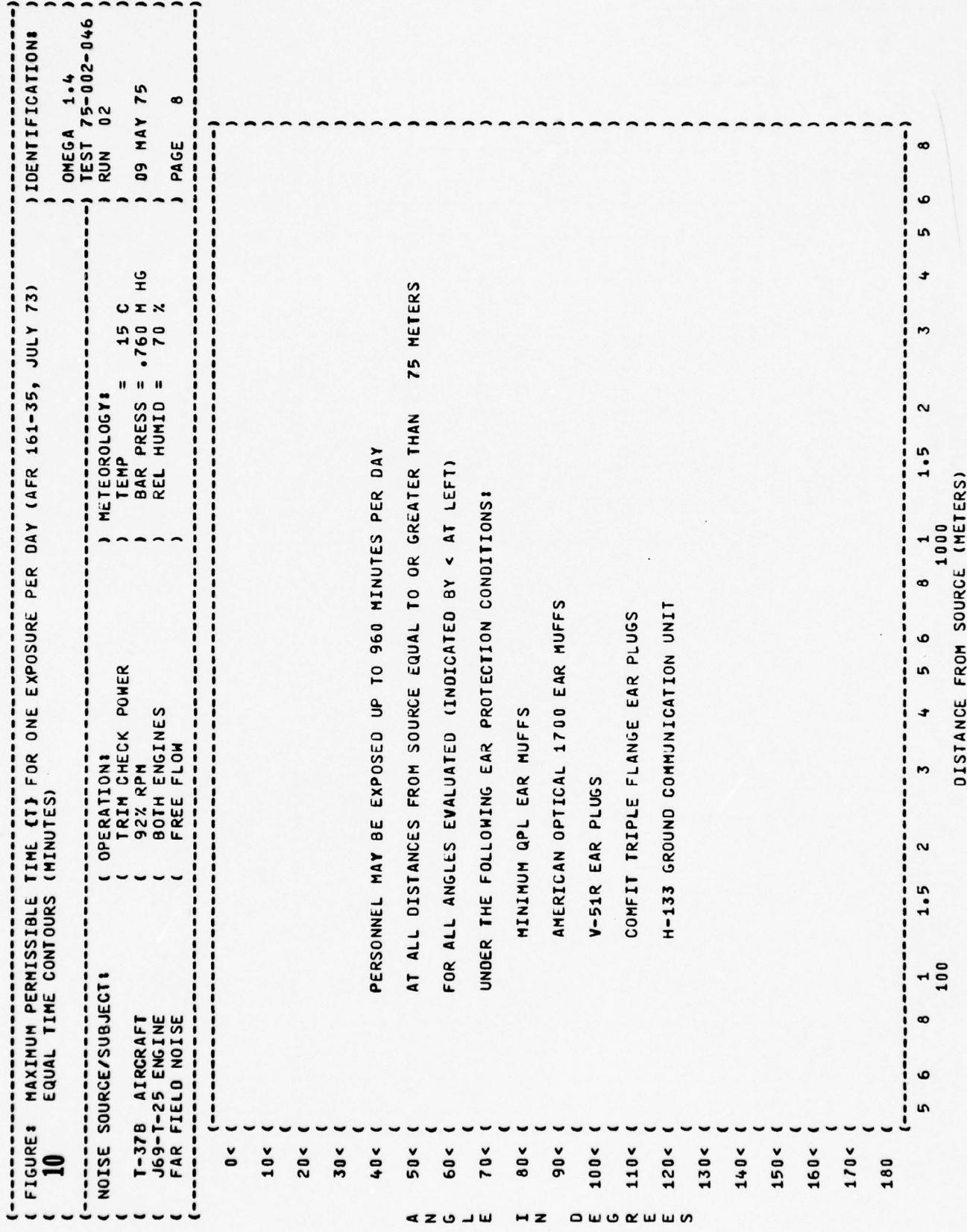
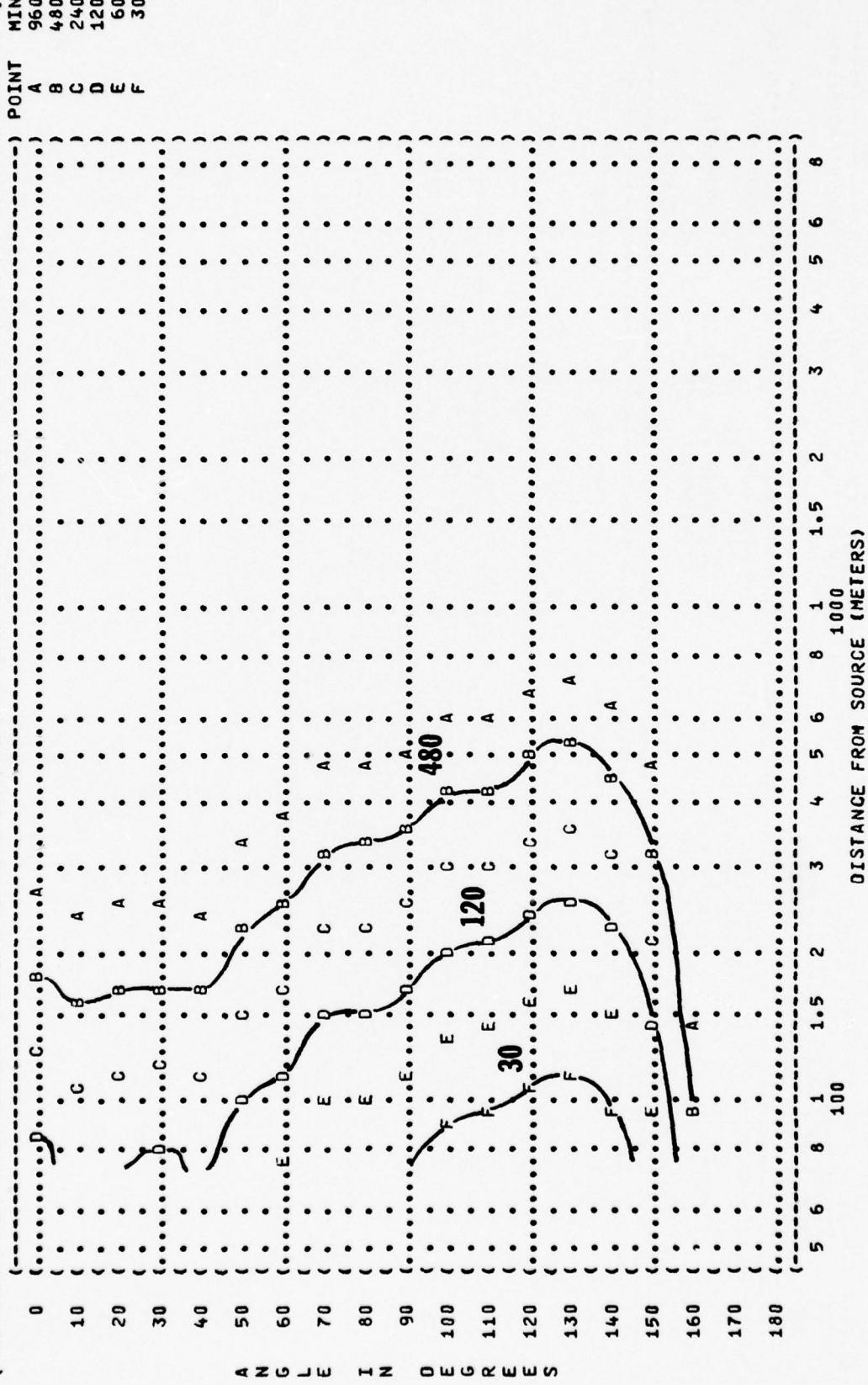
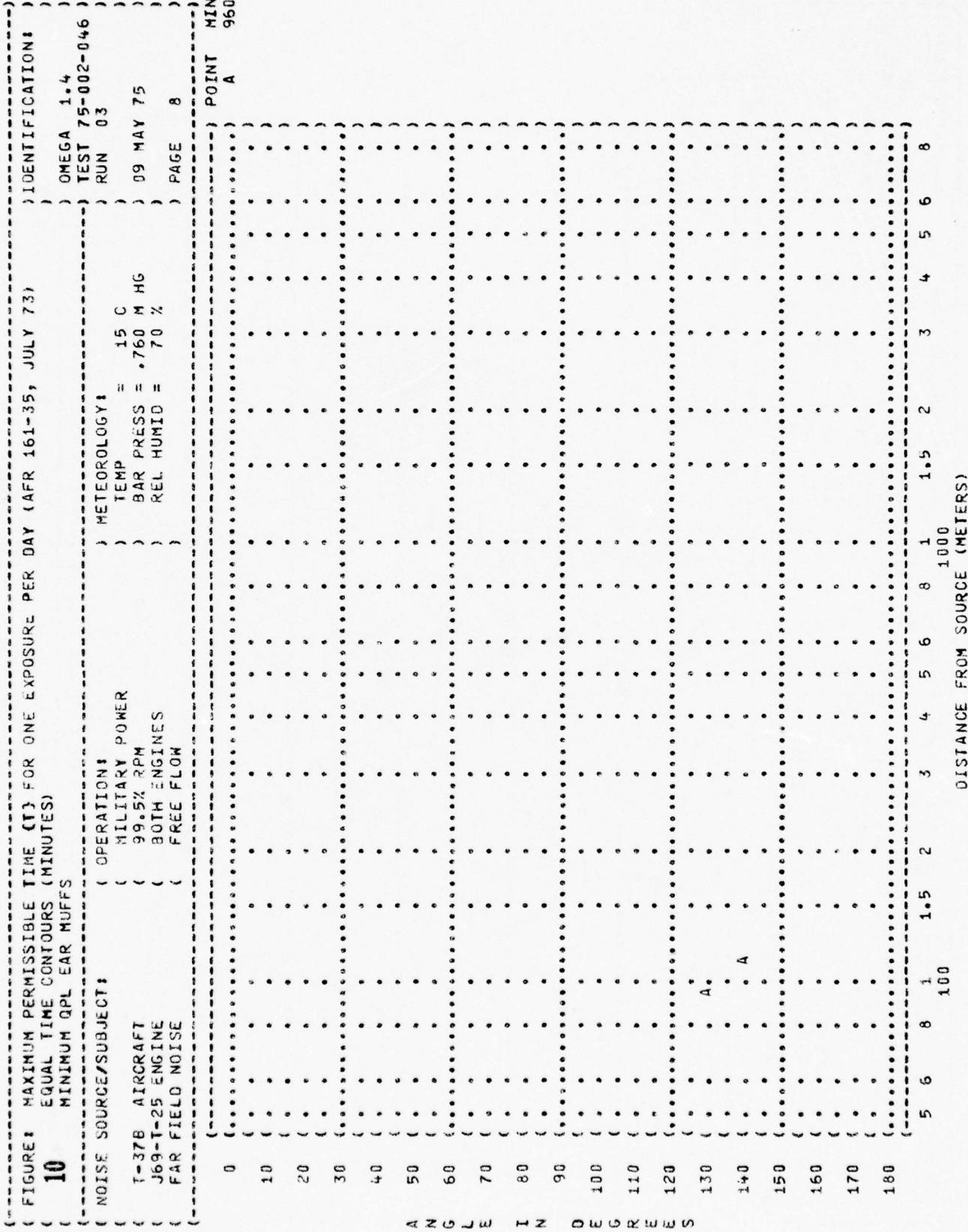


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)
 10 EQUAL TIME CONTOURS (MINUTES)
 NO PROTECTION
 NOISE SOURCE/SUBJECT:
 T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE





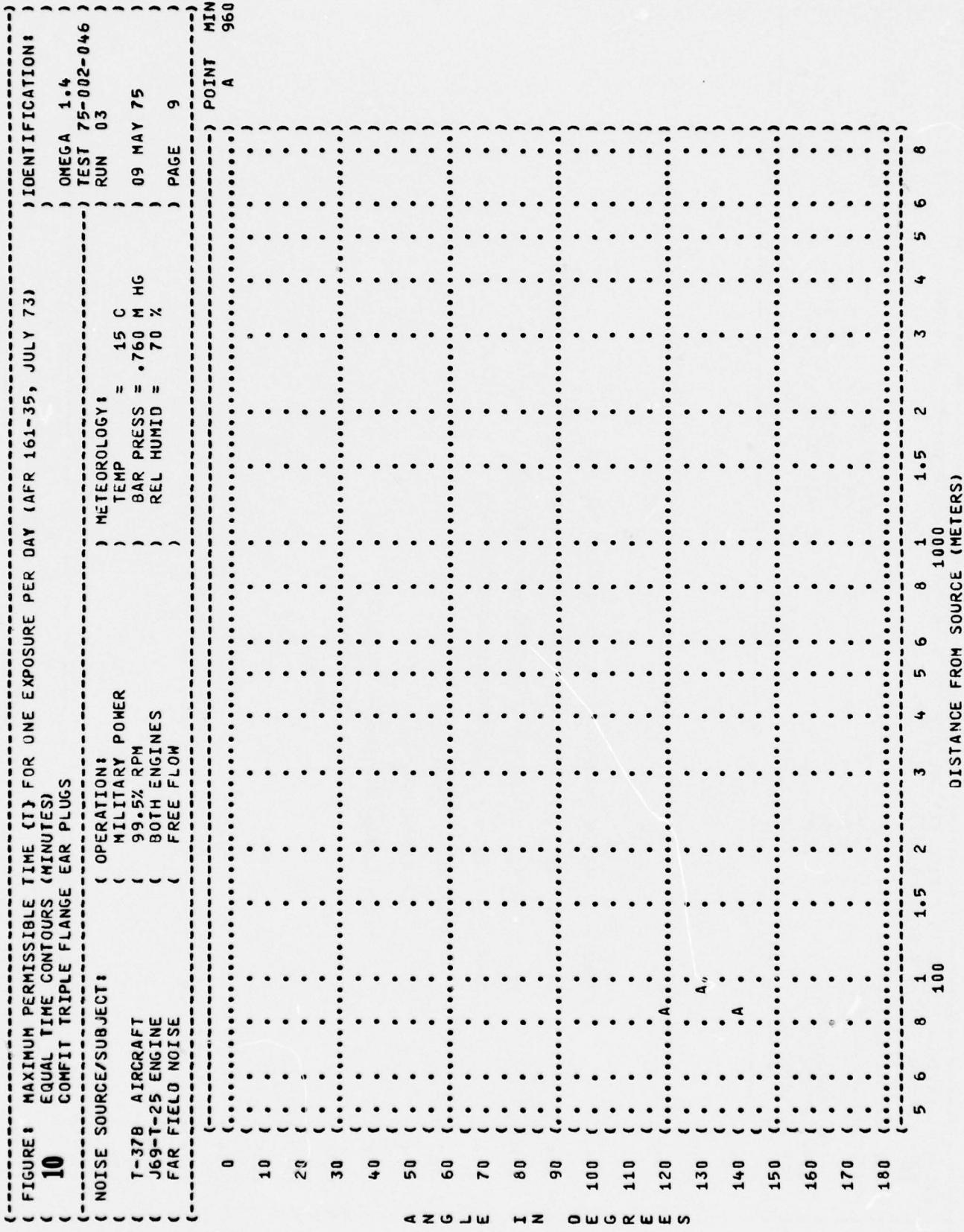


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)
10 EQUAL TIME CONTOURS (MINUTES)



NOISE SOURCE/SUBJECT: OPERATION:
T-37B AIRCRAFT MILITARY POWER
J69-T-25 ENGINE 99.5% RPM
FAR FIELD NOISE BOTH ENGINES
FREE FLOW

METEOROLOGY:
TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %
TEST 75-002-046
RUN 03
09 MAY 75
PAGE 10

UNDER THE FOLLOWING EAR PROTECTION CONDITIONS:

AMERICAN OPTICAL 1700 EAR MUFFS

V-51R EAR PLUGS

H-133 GROUND COMMUNICATION UNIT

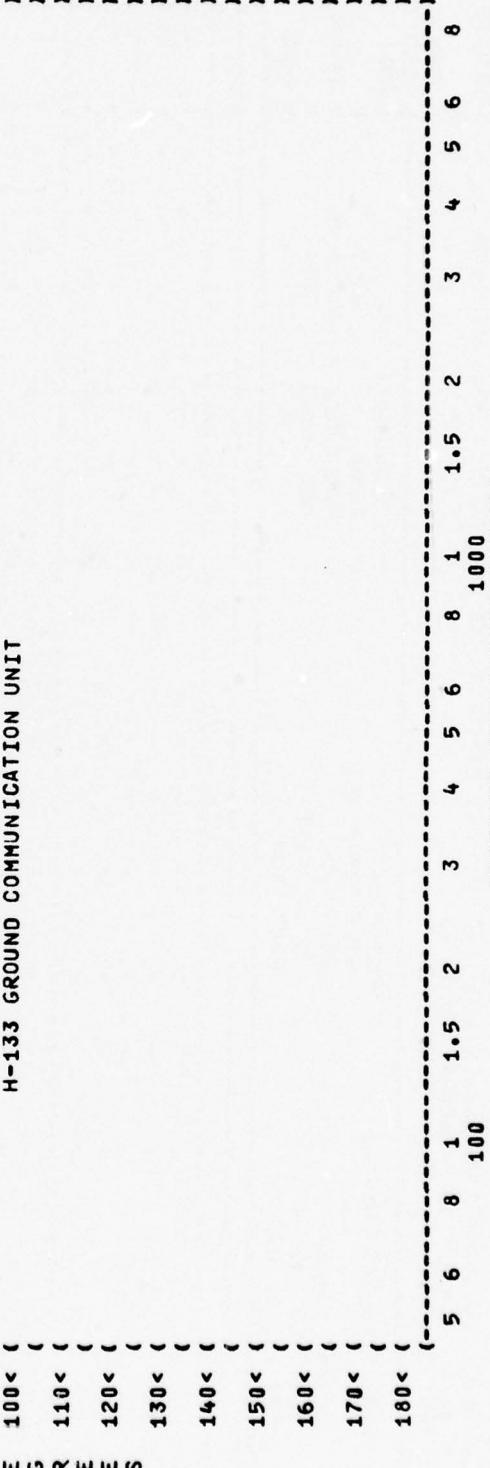


FIGURE 4 SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS (DB)
 31.5 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT: T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

OPERATION:
 IDLE POWER
 37% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 TEST 75-002-046
 RUN 01
 PAGE 18

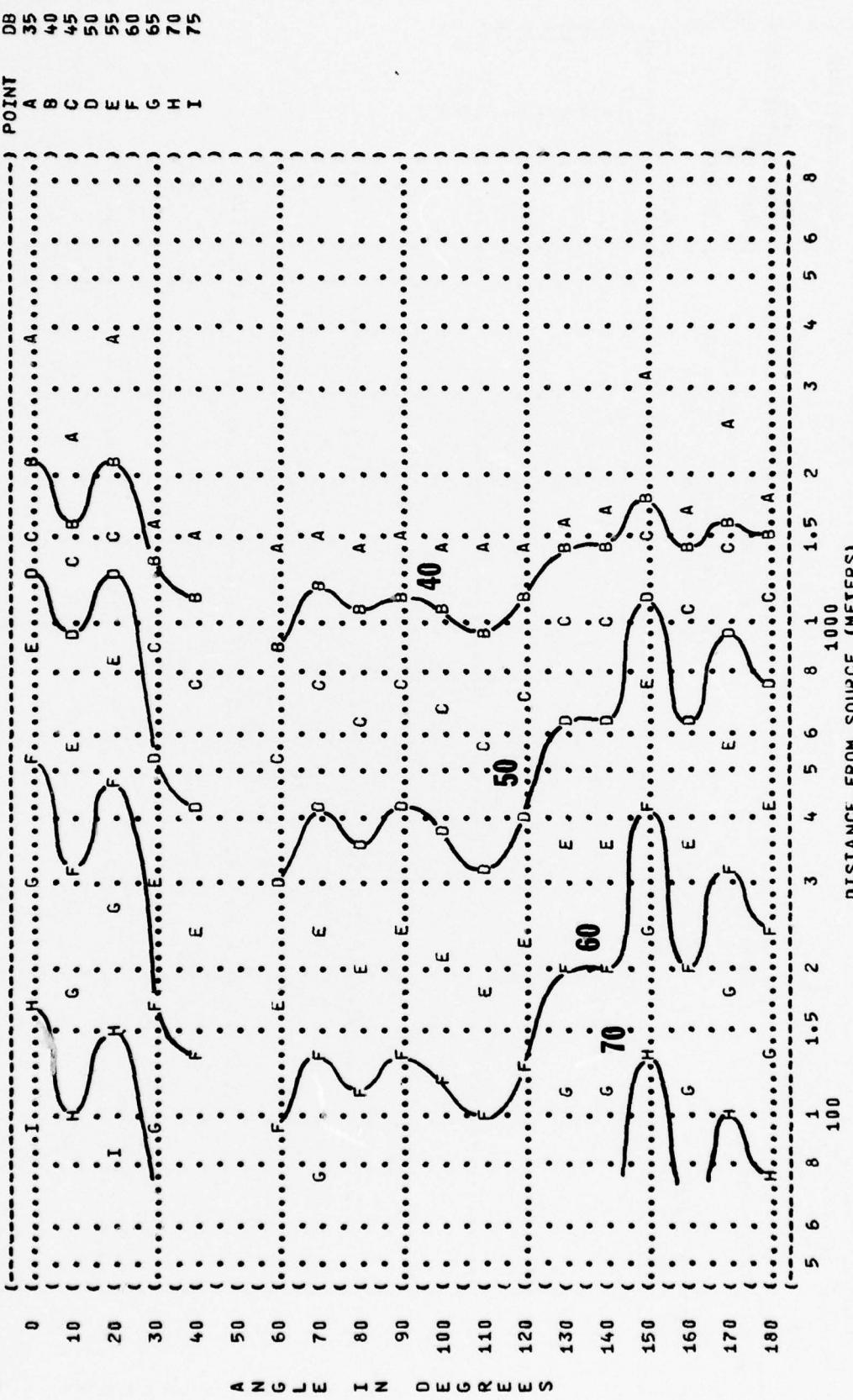


FIGURE: SOUND PRESSURE LEVEL (SPL)
11
 EQUAL LEVEL CONTOURS (0B)
 63 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
 T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

OPERATION:
 IDLE POWER
 37% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 TEST 75-002-046
 RUN 01
 09 MAY 75
 PAGE 19

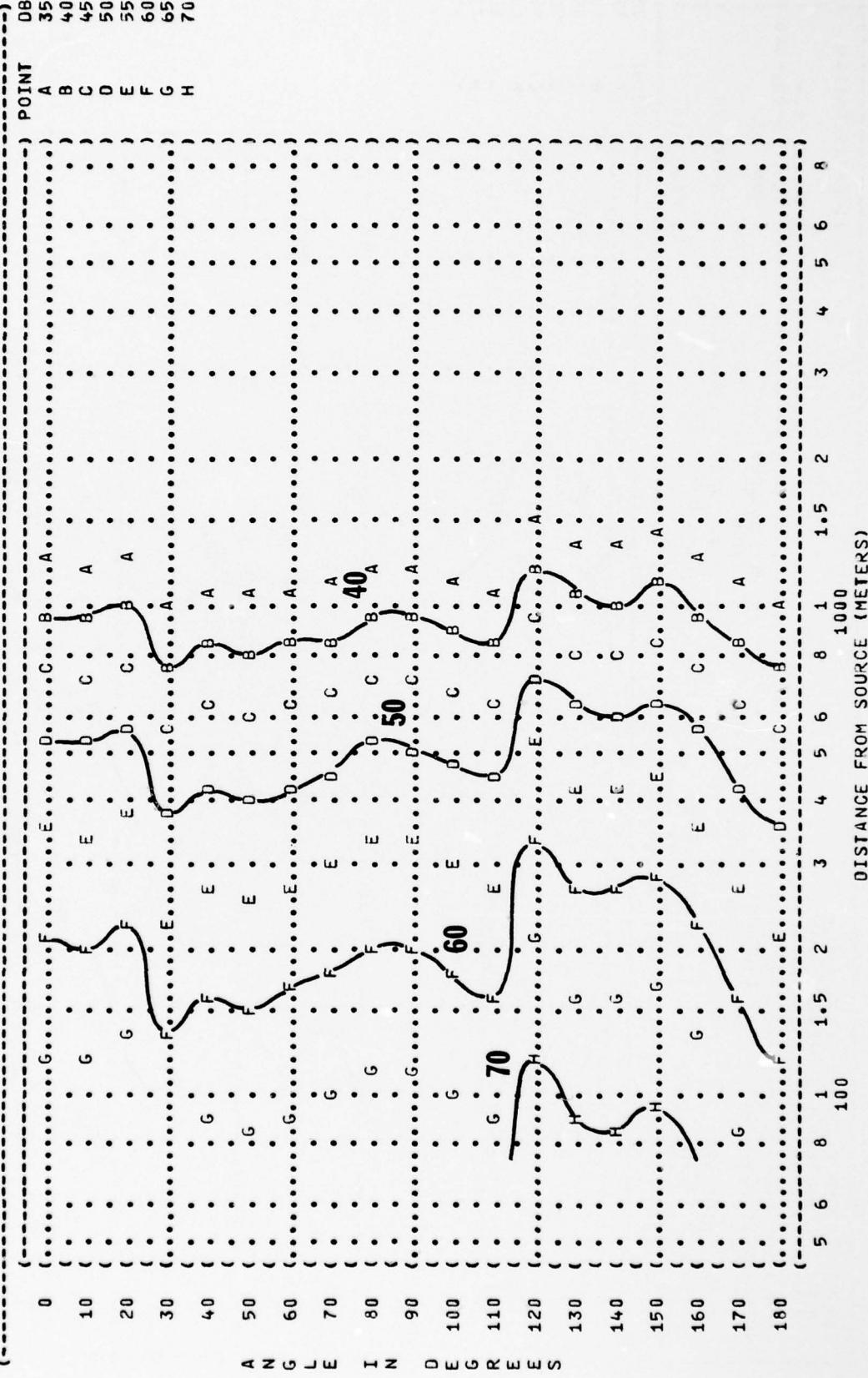
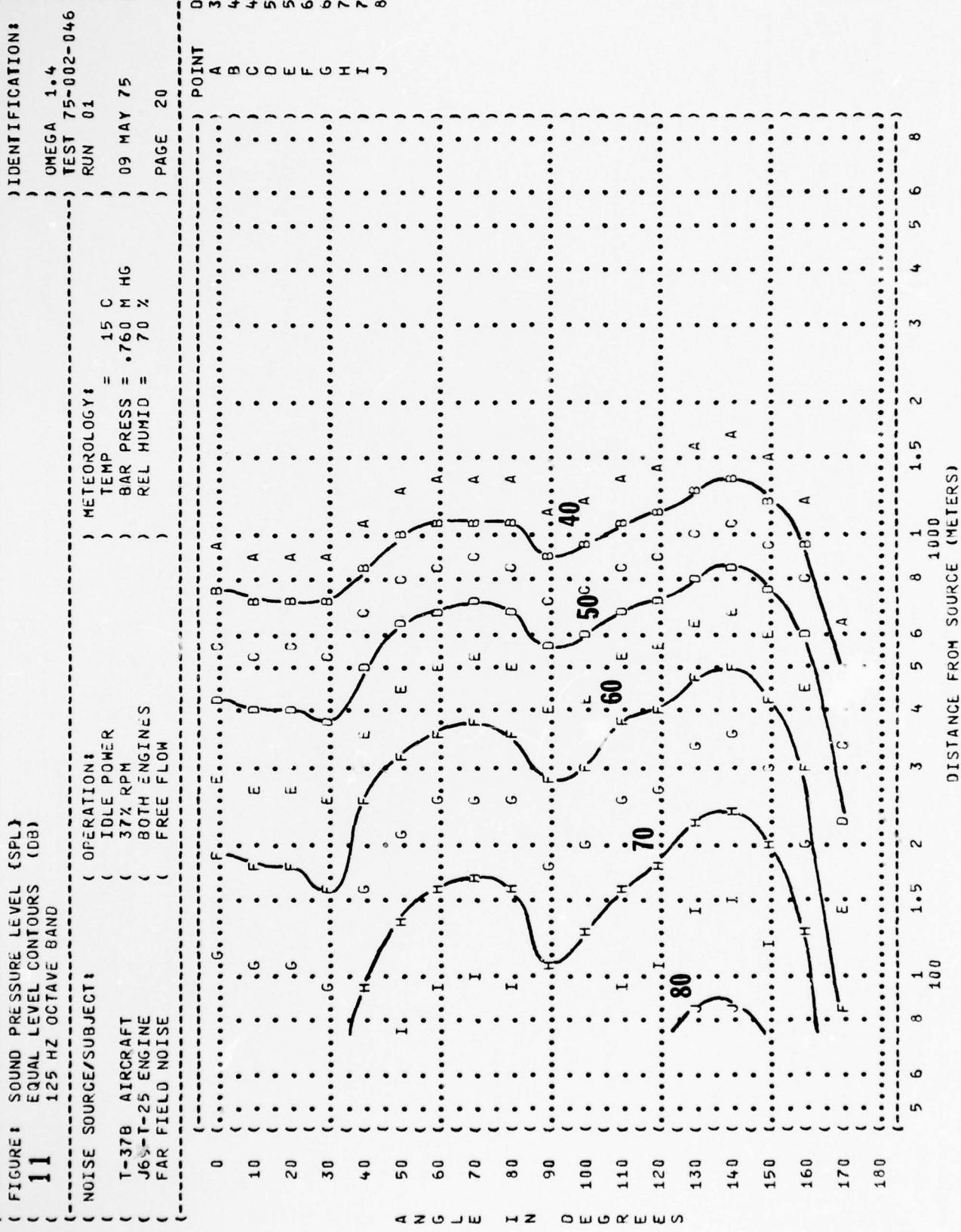


FIGURE: SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS
 125 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
 T-37B AIRCRAFT
 J6-T-25 ENGINE
 FAR FIELD NOISE

OPERATION:
 IDLE POWER
 37% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 PAGE 20



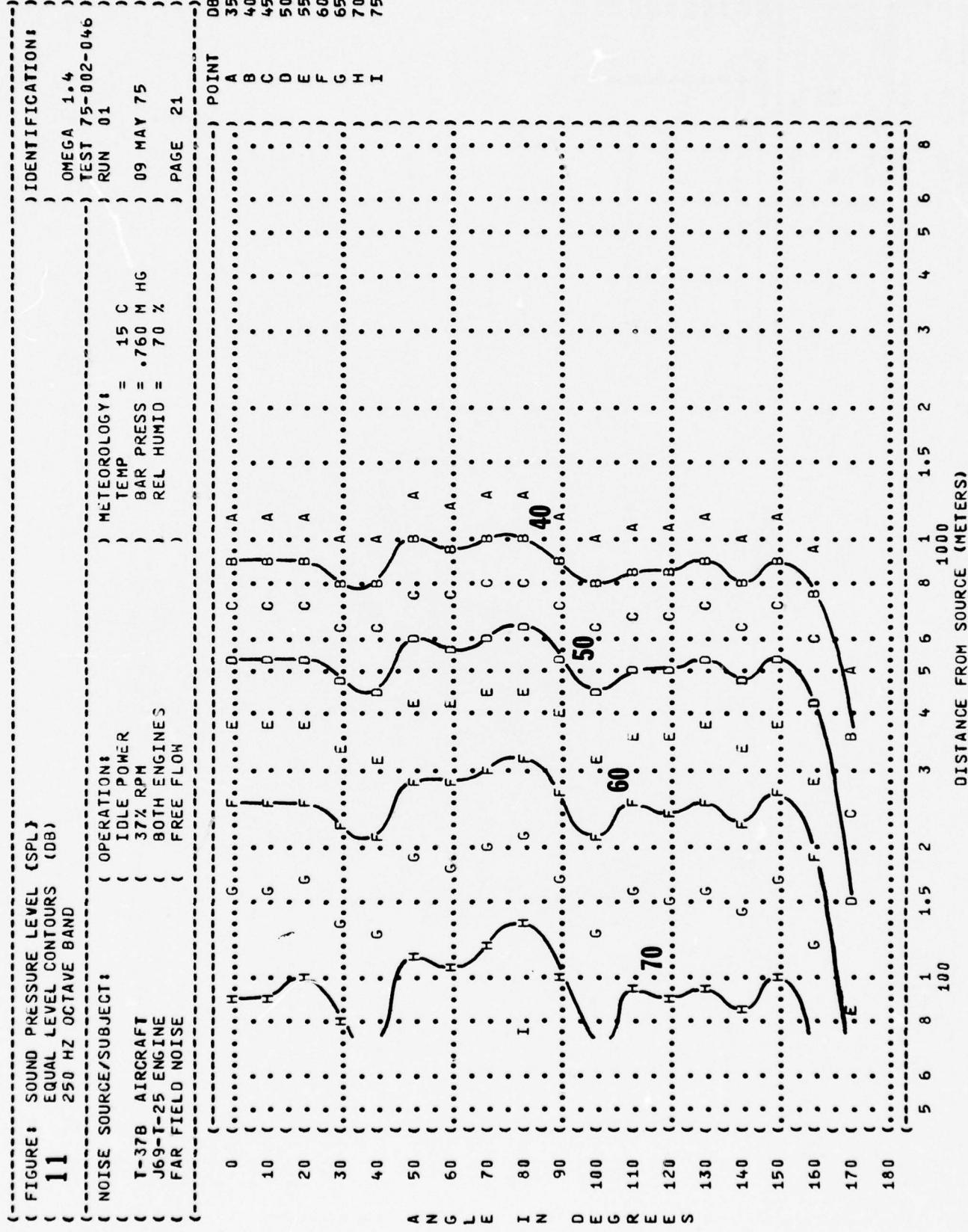


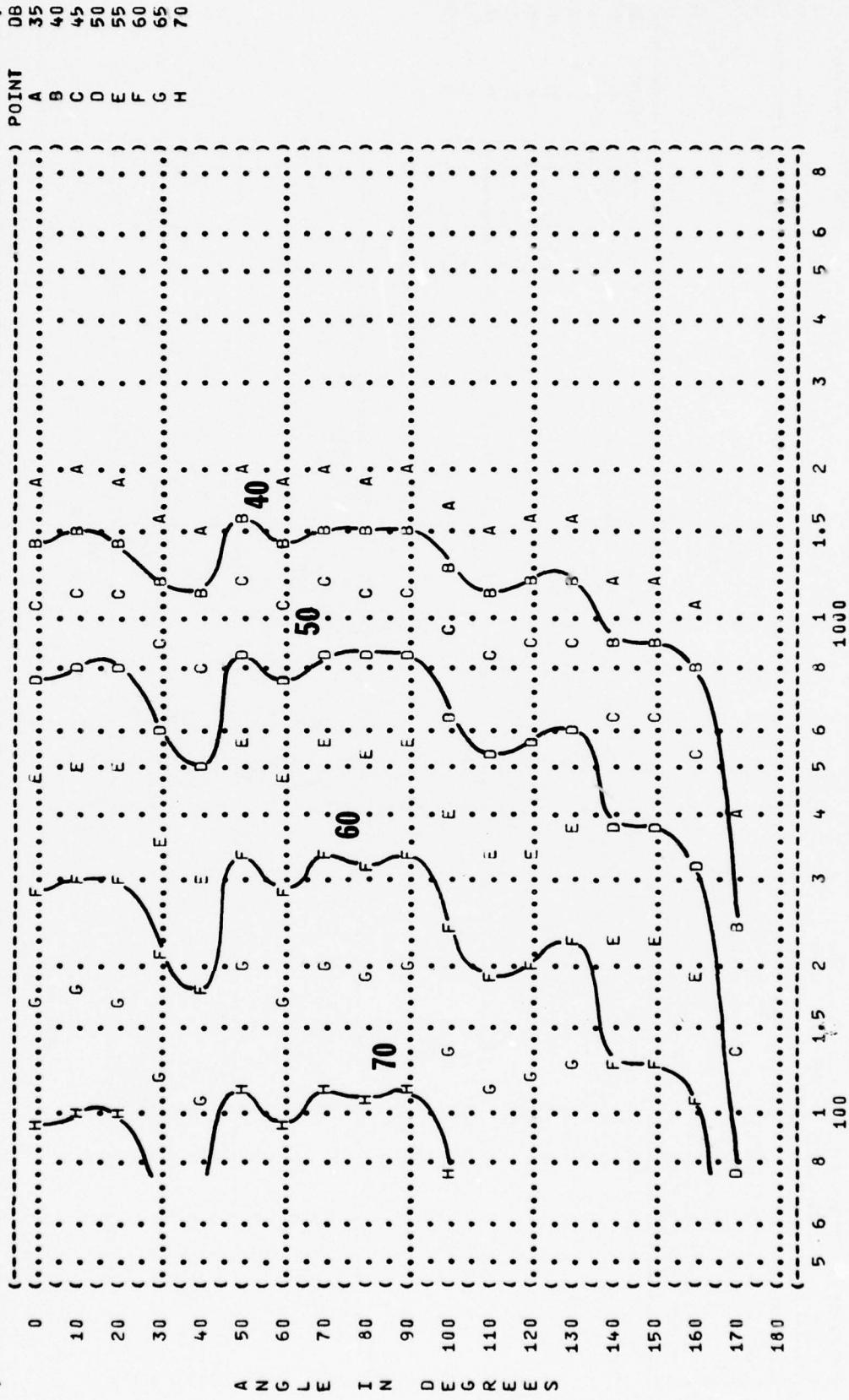
FIGURE 11 SOUND PRESSURE LEVEL (SPL)
EQUAL LEVEL CONTOURS (DB)
500 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

OPERATION:
IDLE POWER
37% RPM
BOTH ENGINES
FREE FLOW

METEOROLOGY:
TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %

TEST 75-002-046
RUN 01
PAGE 22



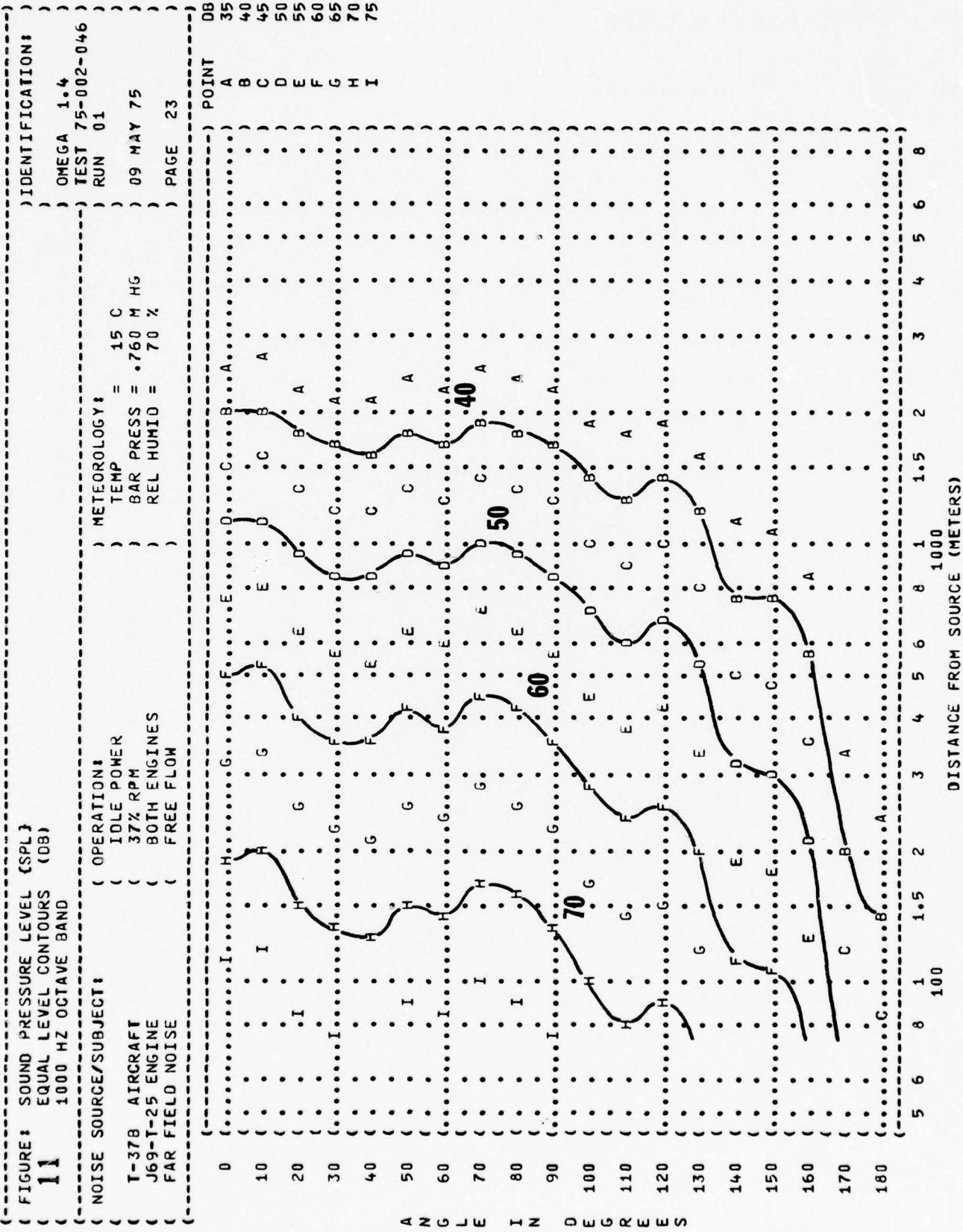


FIGURE: SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS (dB)
2000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE
FREE FLOW

OPERATION:

IDLE POWER
37% RPM
BOTH ENGINES
FREE FLOW

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-046

RUN 01

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 HG

REL HUMID = 70 %

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

K 85

L 90

M 95

N 100

POINT DB

A 40

B 50

C 60

D 70

E 80

F 90

G 100

H 110

I 120

J 130

K 140

L 150

M 160

N 170

O 180

POINT DB

A 50

B 60

C 70

D 80

E 90

F 100

G 110

H 120

I 130

J 140

K 150

L 160

M 170

N 180

POINT DB

A 60

B 70

C 80

D 90

E 100

F 110

G 120

H 130

I 140

J 150

K 160

L 170

M 180

POINT DB

A 70

B 80

C 90

D 100

E 110

F 120

G 130

H 140

I 150

J 160

K 170

L 180

POINT DB

A 80

B 90

C 100

D 110

E 120

F 130

G 140

H 150

I 160

J 170

K 180

POINT DB

A 90

B 100

C 110

D 120

E 130

F 140

G 150

H 160

I 170

J 180

POINT DB

A 100

B 110

C 120

D 130

E 140

F 150

G 160

H 170

I 180

POINT DB

A 110

B 120

C 130

D 140

E 150

F 160

G 170

H 180

POINT DB

A 120

B 130

C 140

D 150

E 160

F 170

G 180

H 180

I 180

J 180

K 180

L 180

M 180

N 180

09 MAY 75

PAGE 24

FIGURE: SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS
4000 Hz OCTAVE BAND

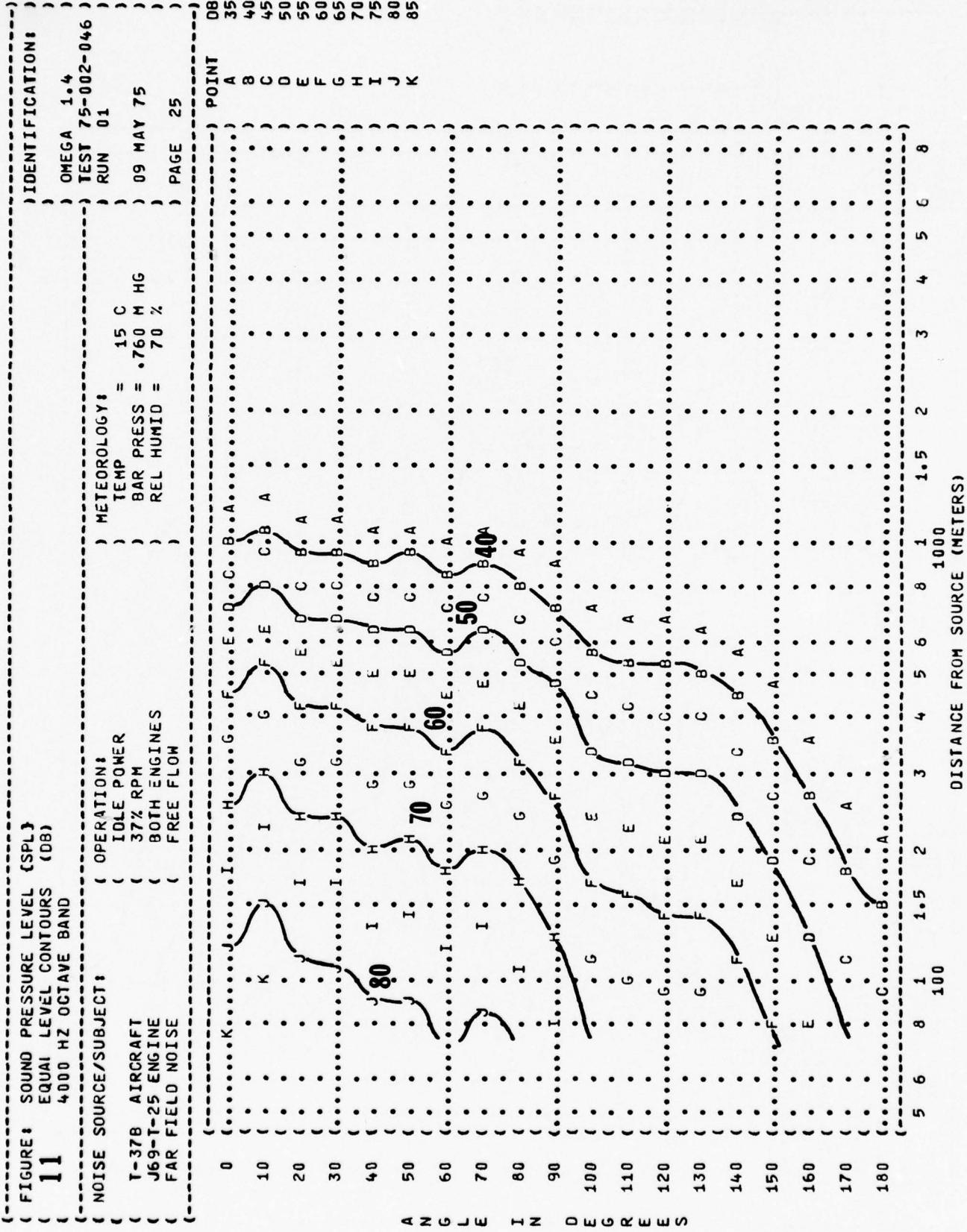
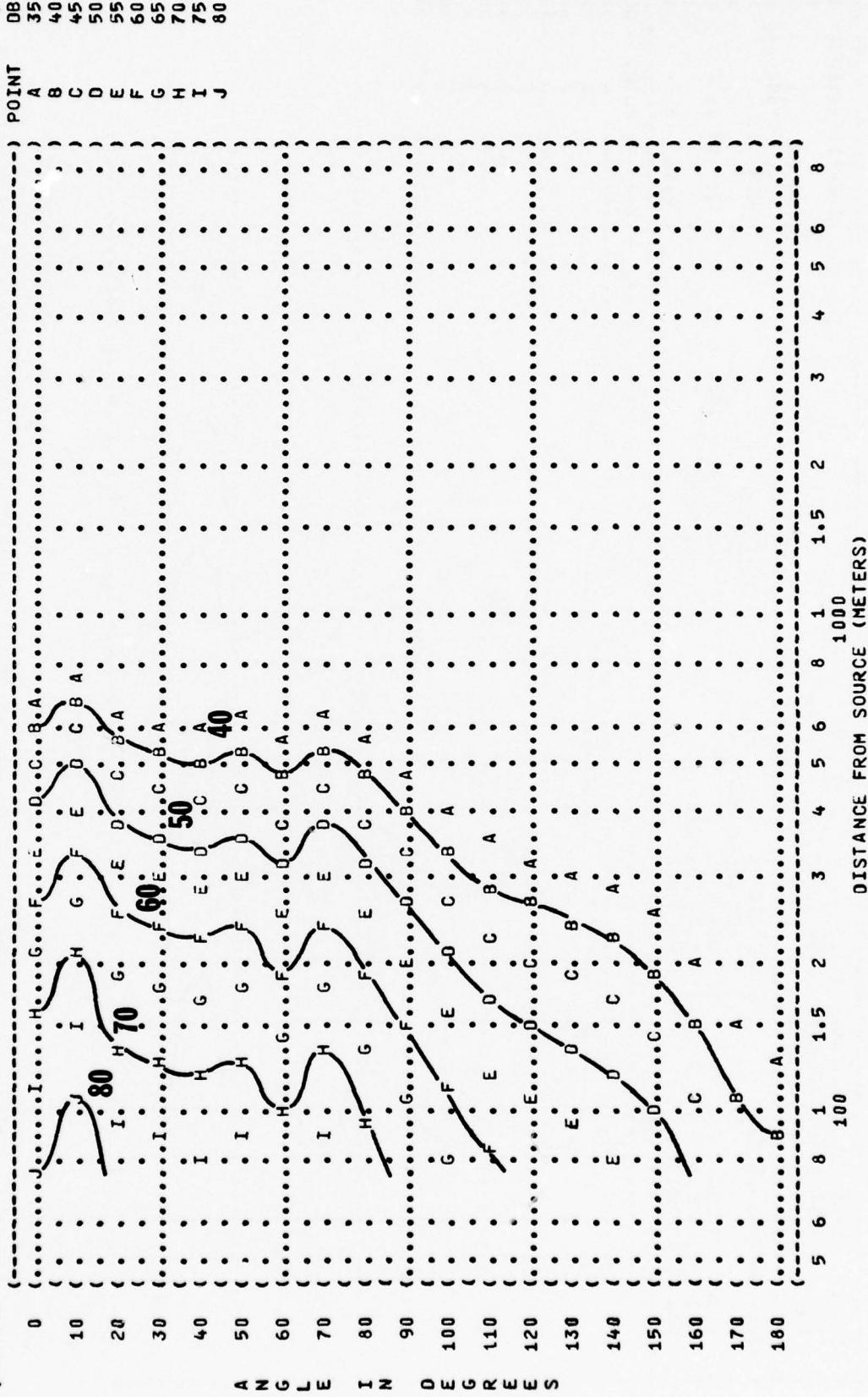


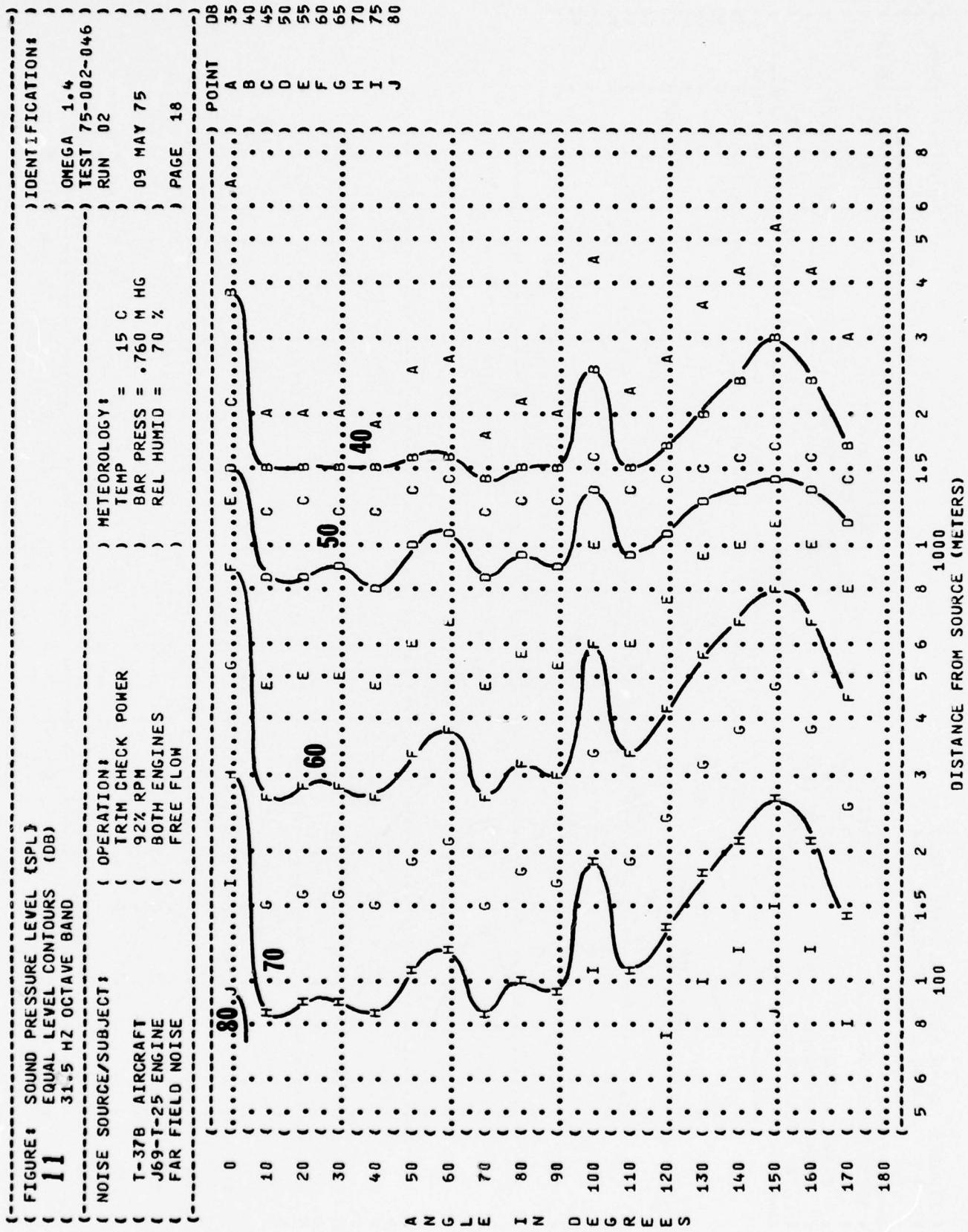
FIGURE: SOUND PRESSURE LEVEL (SPL)
11
 EQUAL LEVEL CONTOURS (DB)
 8000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
 T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

OPERATIONS:
 IDLE POWER
 37% RPM
 BOTH ENGINES
 FREE FLOW

IDENTIFICATION:
 OMEGA 1.4
 TEST 75-002-046
 RUN 01
 METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 PAGE 26





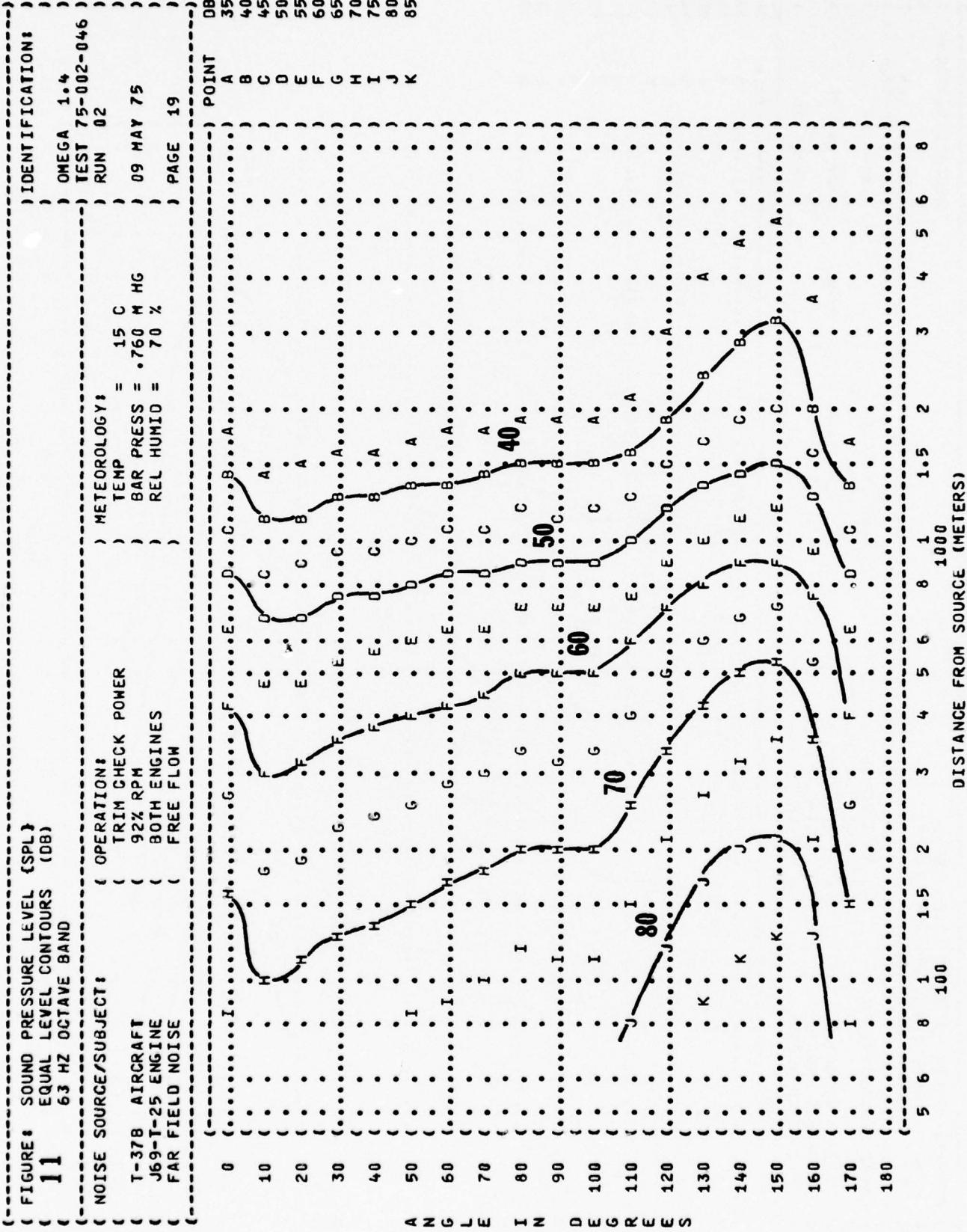


FIGURE 1 SOUND PRESSURE LEVEL (SPL)
11
 EQUAL LEVEL CONTOURS (DB)
 250 HZ OCTAVE BAND

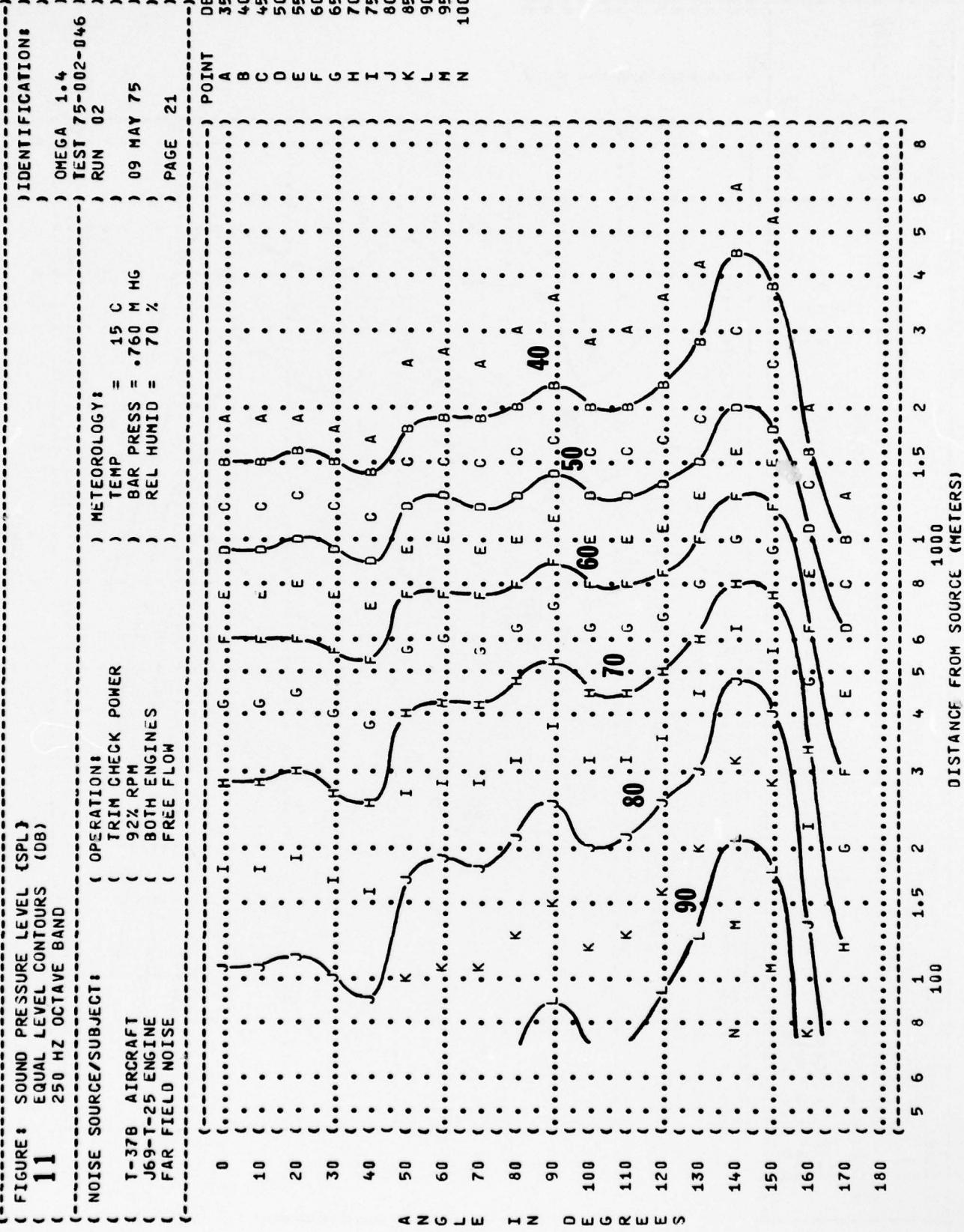


FIGURE: SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS (DB)
 500 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT: **T-37B AIRCRAFT**
 T-69-T-25 ENGINE
 FAR FIELD NOISE
 BOTH ENGINES
 FREE FLOW

OPERATION:
 TRIM CHECK POWER
 92% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 TEST 75-002-046
 RUN 02
 PAGE 22

IDENTIFICATION:

OMEGA 1.4

09 MAY 75

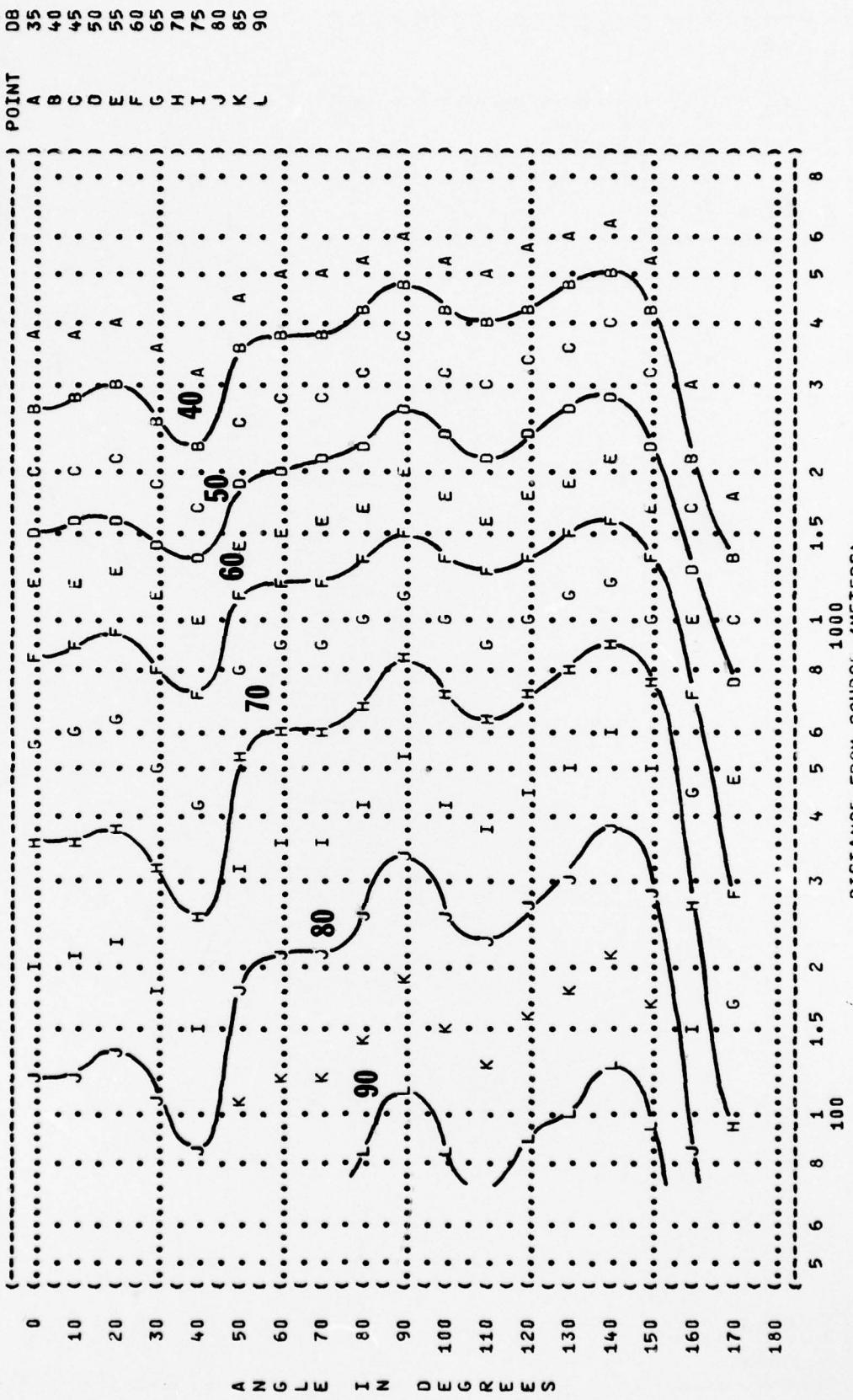


FIGURE 11
SOUND PRESSURE LEVEL (SPL)
EQUAL LEVEL CONTOURS (DB)
1000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT: T-37B AIRCRAFT

J69-T-25 ENGINE
FAR FIELD NOISE
OPERATION: TRIM CHECK POWER
92% RPM
BOTH ENGINES
FREE FLOW

IDENTIFICATION:
OMEGA 1.4
TEST 75-002-046
RUN 02

09 MAY 75
REL HUMID = 70 %
PAGE 23

METEOROLOGY:
TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %

POINT DB
A 35
B 40
C 45
D 50
E 55
F 60
G 65
H 70
I 75
J 80
K 85
L 90

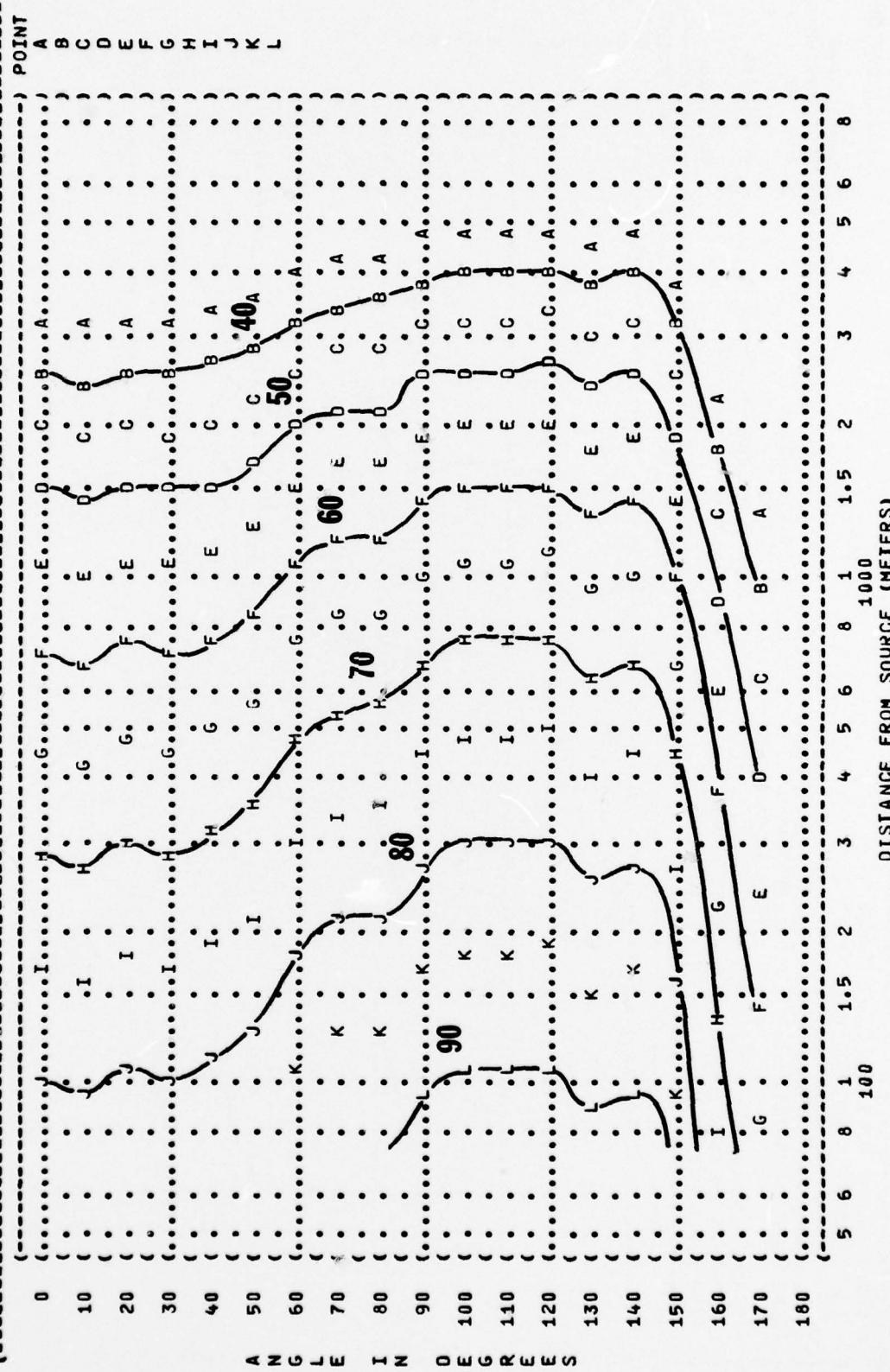
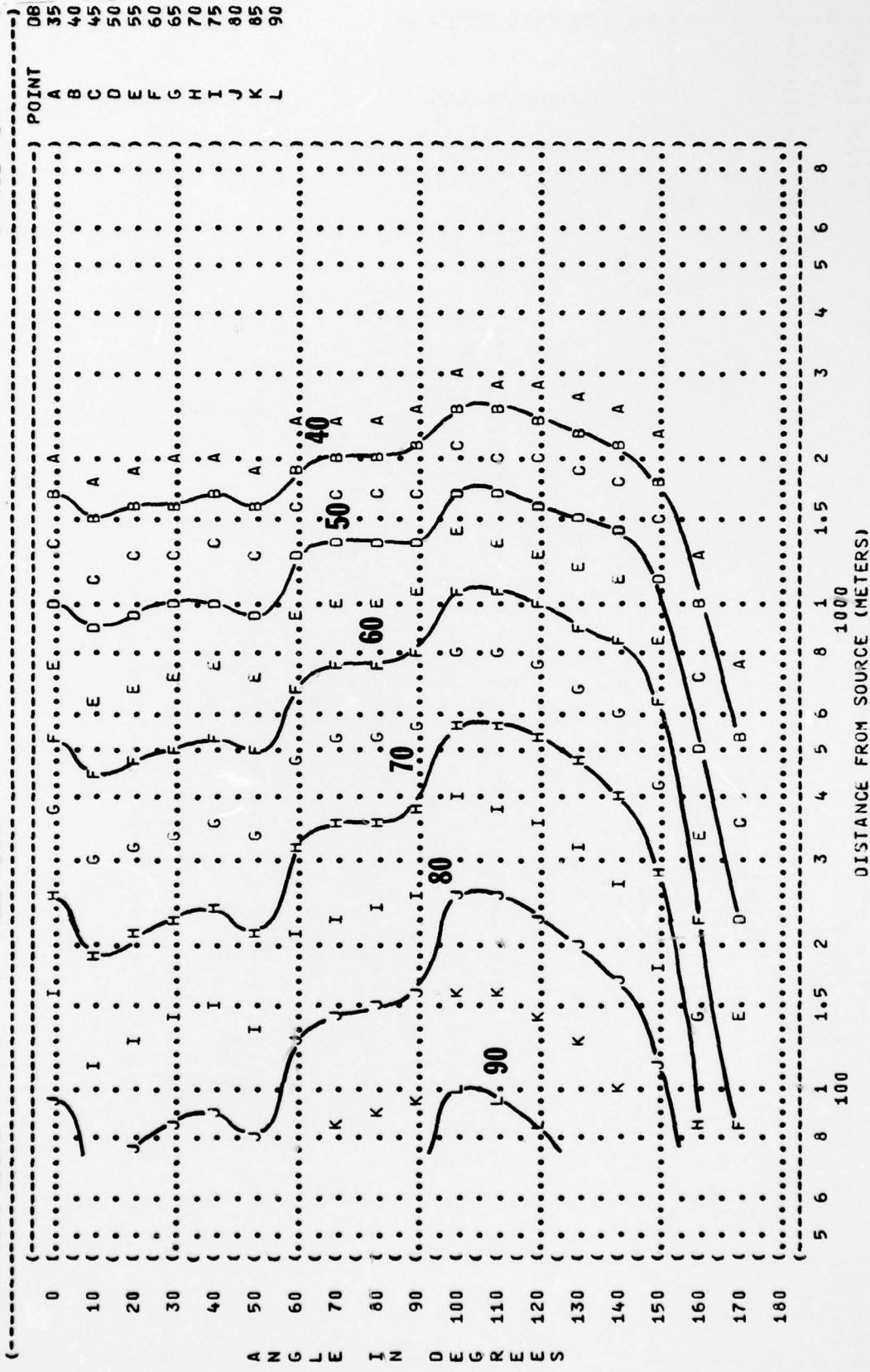


FIGURE: SOUND PRESSURE LEVEL (SPL)
11
 EQUAL LEVEL CONTOURS (DB)
 2000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
 T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

OPERATION:
 TRIM CHECK POWER
 92% RPM
 BOTH ENGINES
 FREE FLOW



(FIGURE: SOUND PRESSURE LEVEL (SPL)
 11 EQUAL LEVEL CONTOURS (DB)
 4000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
 T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

OPERATION:
 92% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %

TEST 75-002-046
 RUN 02
 09 MAY 75
 PAGE 25

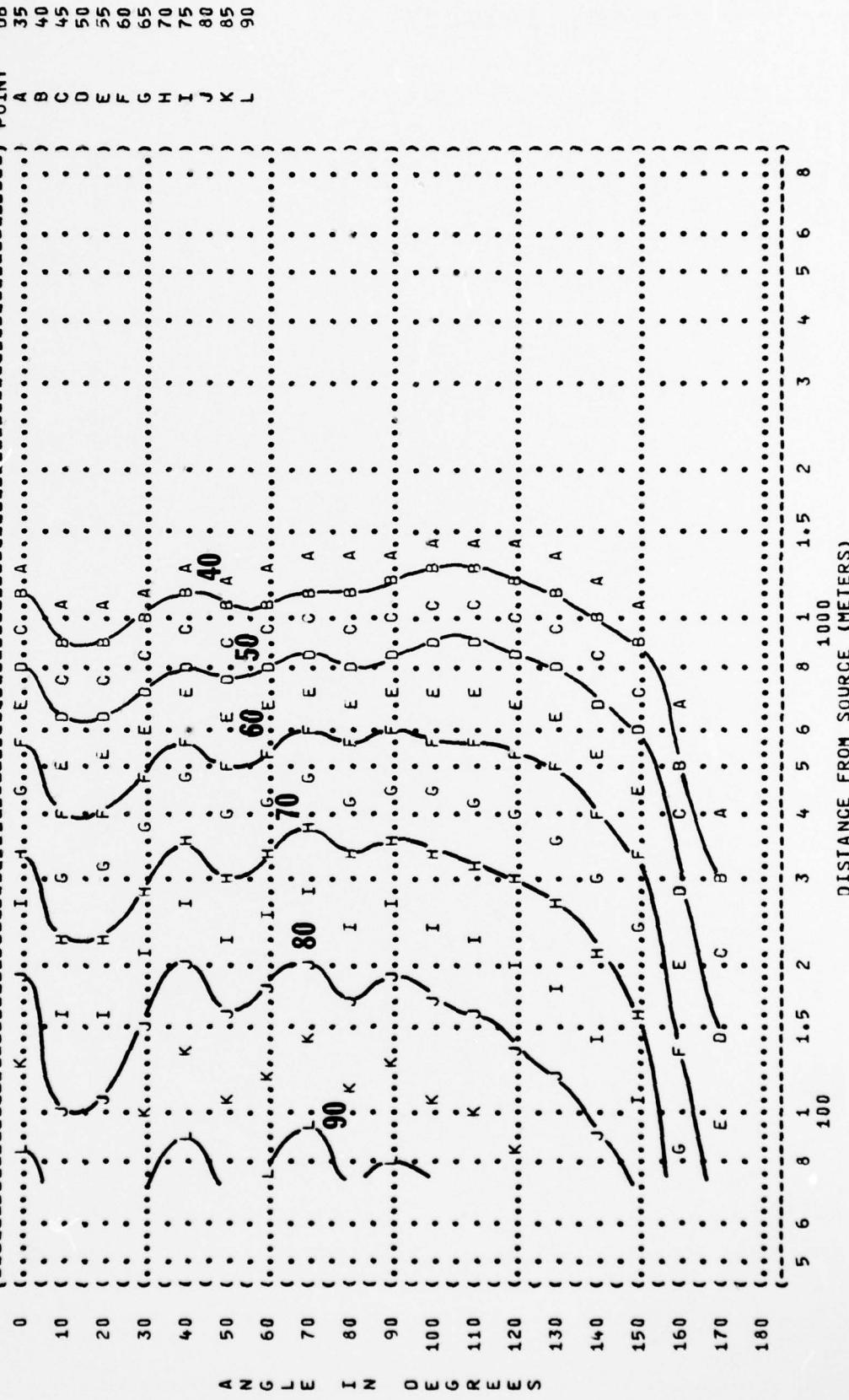


FIGURE: SOUND PRESSURE LEVEL (SPL)
11
 EQUAL LEVEL CONTOURS (DB)
 8000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-046

RUN 02

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

PAGE 26

OPERATION:

TRIM CHECK POWER

92% RPM

BOTH ENGINES

FREE FLOW

POINT 08

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

K 85

L 90

M 95

N 100

O 105

P 110

Q 115

R 120

S 125

T 130

U 135

V 140

W 145

X 150

Y 155

Z 160

AA 165

AB 170

AC 175

AD 180

AE 185

AF 190

AG 195

AH 200

AI 205

AJ 210

AK 215

AL 220

AM 225

AN 230

AO 235

AP 240

AQ 245

AR 250

AS 255

AT 260

AU 265

AV 270

AW 275

AX 280

AY 285

AZ 290

BA 295

CA 300

DA 305

EA 310

FA 315

GA 320

HA 325

IA 330

JA 335

KA 340

LA 345

MA 350

NA 355

OA 360

PA 365

QA 370

RA 375

SA 380

TA 385

UA 390

VA 395

WA 400

ZA 405

AA 410

BA 415

CA 420

DA 425

EA 430

FA 435

GA 440

HA 445

IA 450

JA 455

KA 460

LA 465

MA 470

NA 475

OA 480

PA 485

QA 490

RA 495

SA 500

TA 505

UA 510

VA 515

WA 520

ZA 525

AA 530

BA 535

CA 540

DA 545

EA 550

FA 555

GA 560

HA 565

IA 570

JA 575

KA 580

LA 585

MA 590

NA 595

OA 600

PA 605

QA 610

RA 615

SA 620

TA 625

UA 630

VA 635

WA 640

ZA 645

AA 650

BA 655

CA 660

DA 665

EA 670

FA 675

GA 680

HA 685

IA 690

JA 695

KA 700

LA 705

MA 710

NA 715

OA 720

PA 725

QA 730

RA 735

SA 740

TA 745

UA 750

VA 755

WA 760

ZA 765

AA 770

BA 775

CA 780

DA 785

EA 790

FA 795

GA 800

HA 805

IA 810

JA 815

KA 820

LA 825

MA 830

NA 835

OA 840

PA 845

QA 850

RA 855

SA 860

TA 865

UA 870

VA 875

WA 880

ZA 885

AA 890

BA 895

CA 900

DA 905

EA 910

FA 915

GA 920

HA 925

IA 930

JA 935

KA 940

LA 945

MA 950

NA 955

OA 960

PA 965

QA 970

RA 975

SA 980

TA 985

UA 990

VA 995

WA 1000

DISTANCE FROM SOURCE (METERS)

FIGURE: SOUND PRESSURE LEVEL {SPL}
11 EQUAL LEVEL CONTOURS
31.5 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

MILITARY POWER
99.5% RPM
BOTH ENGINES
FREE FLOW

OPERATION:
TEST 75-002-046
RUN 03
PAGE 18

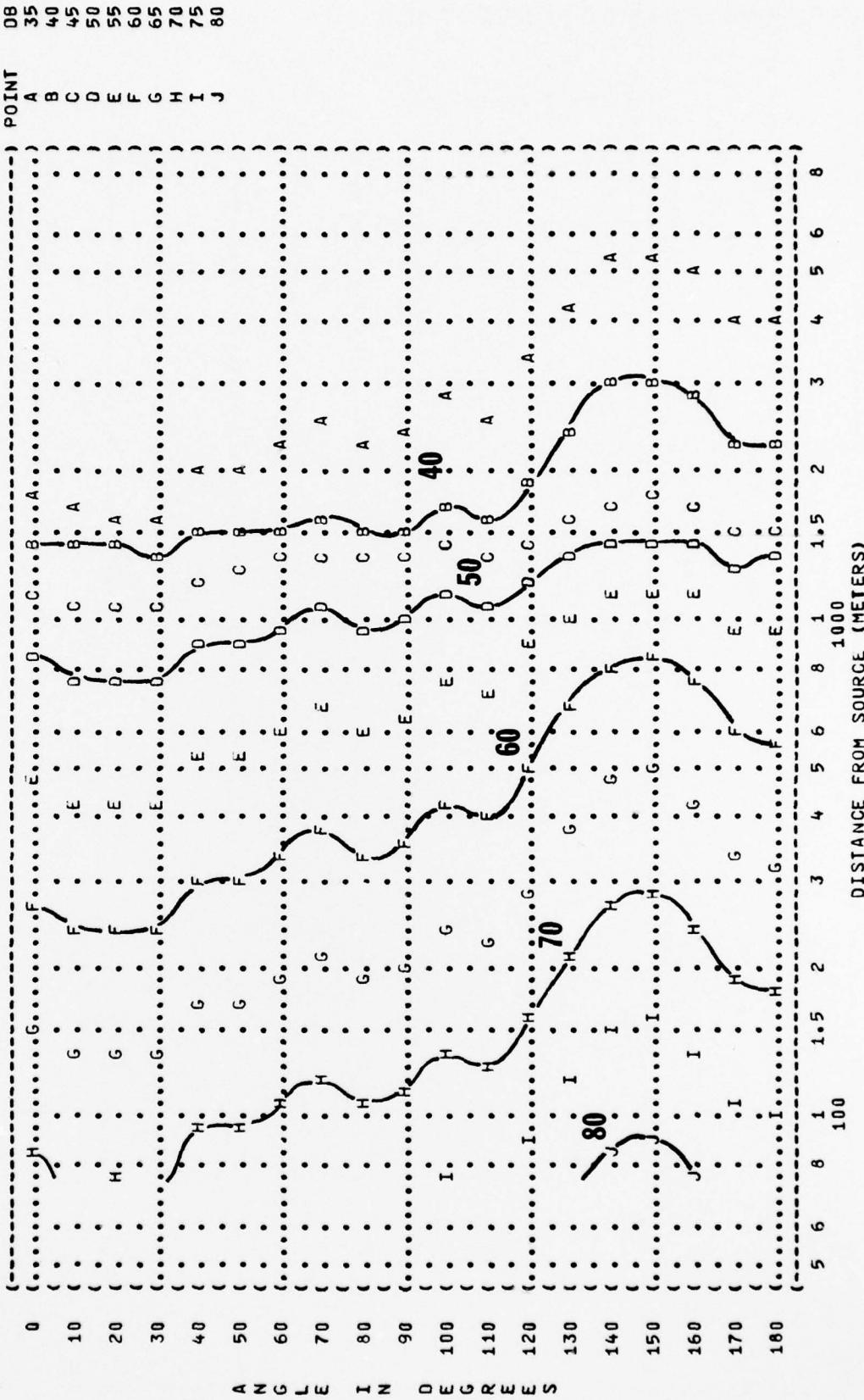


FIGURE 1 SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL OCTAVE BAND
 63 Hz

NOISE SOURCE/SUBJECT:
 T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

OPERATION:
 MILITARY POWER
 99.5% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 PAGE 19

IDENTIFICATION:
 OMEGA 1.4
 TEST 75-002-046
 RUN 03

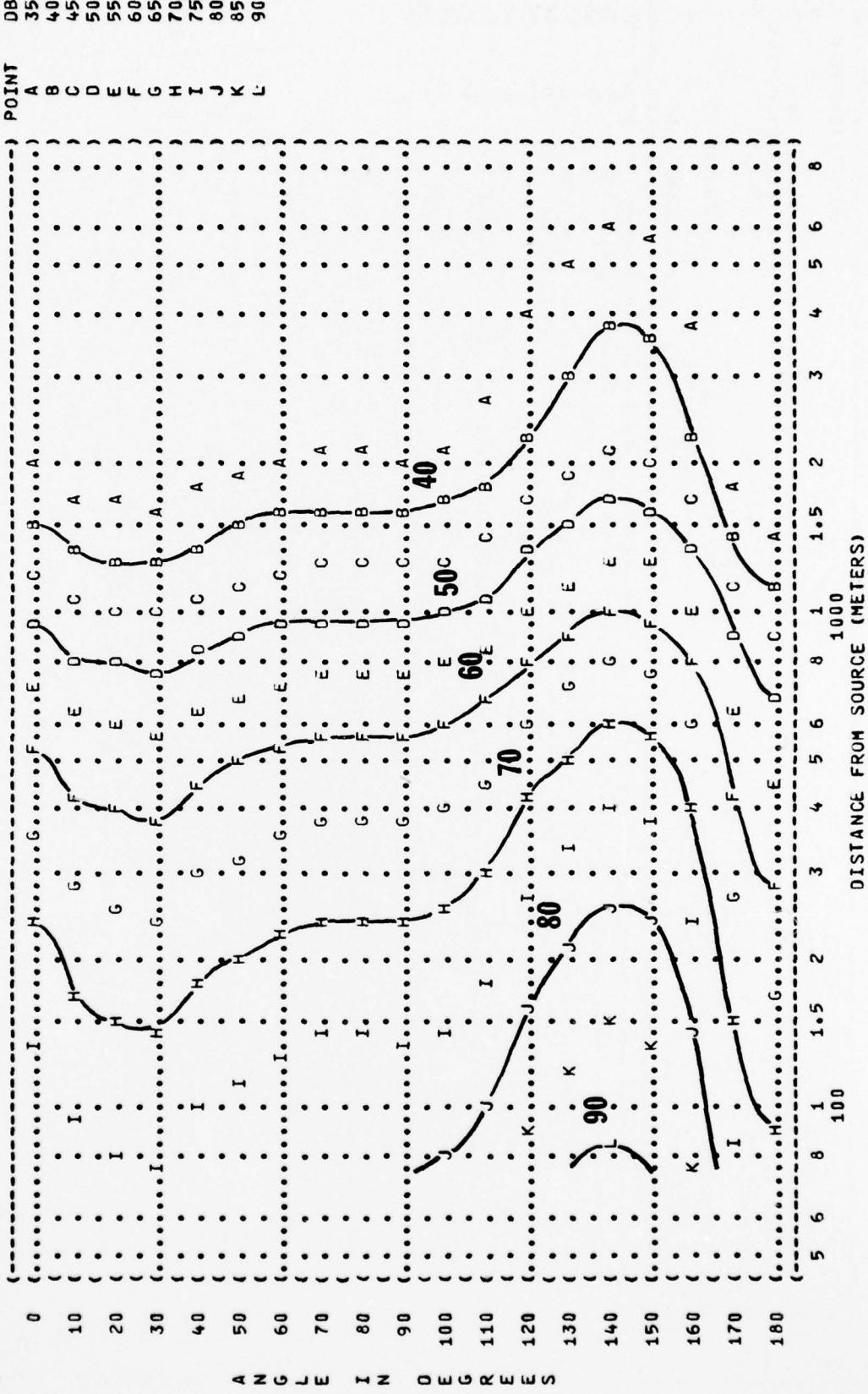


FIGURE 11
SOUND PRESSURE LEVEL (SPL)
EQUAL LEVEL CONTOURS (DB)
125 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

OPERATION:
MILITARY POWER
99.5% RPM
BOTH ENGINES
FREE FLOW

METEOROLOGY:
TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %

TEST 75-002-046
RUN 03

09 MAY 75

PAGE 20

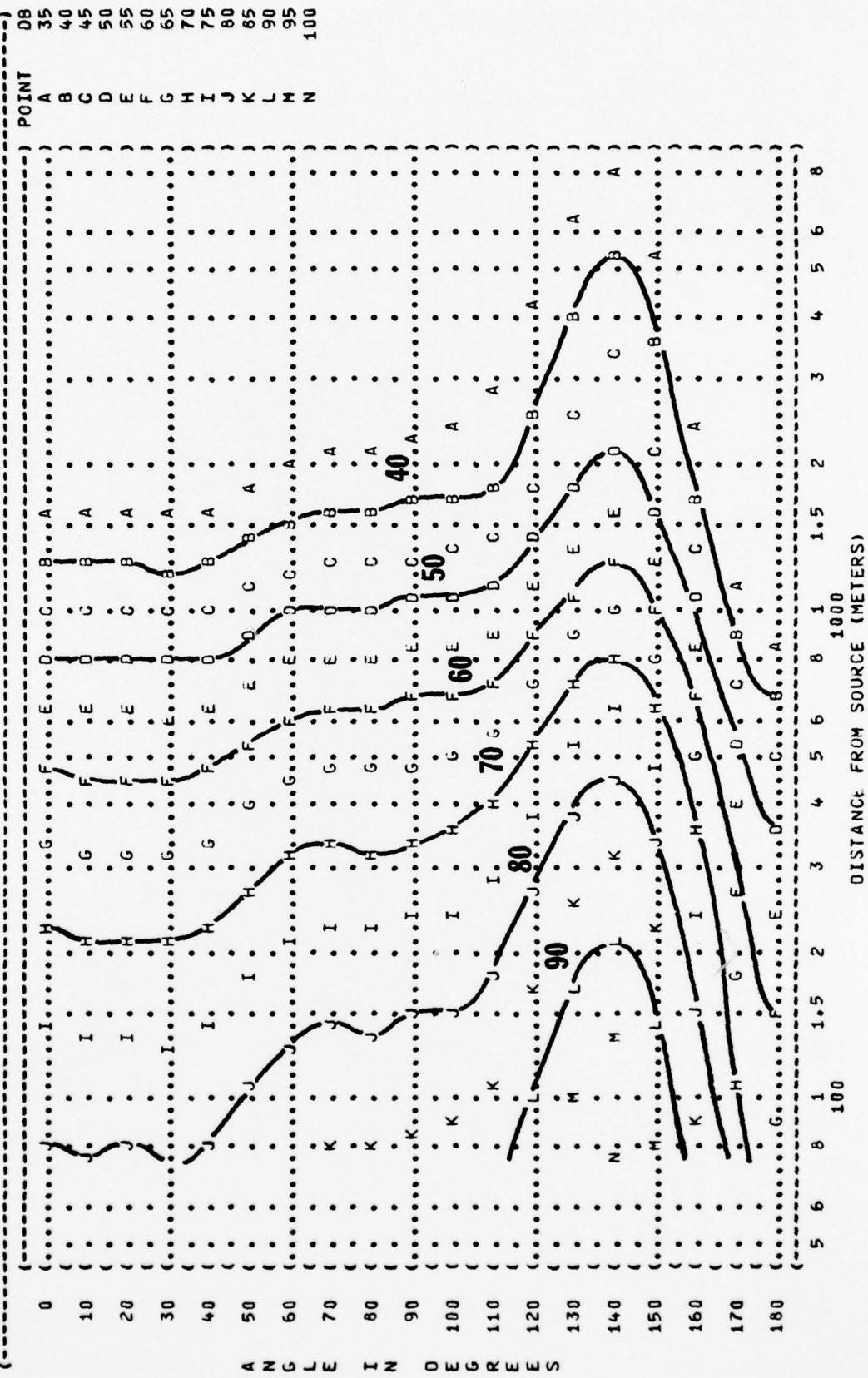


FIGURE: SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS (dB)
250 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

OPERATION:
MILITARY POWER
99.5% RPM
BOTH ENGINES
FREE FLOW

METEOROLOGY:
TEMP = 15 C
BAR PRESS = 760 Hg
REL HUMID = 70 %

RUN 03
TEST 75-002-046
09 MAY 75
PAGE 21

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-046

RUN 03

09 MAY 75

PAGE 21

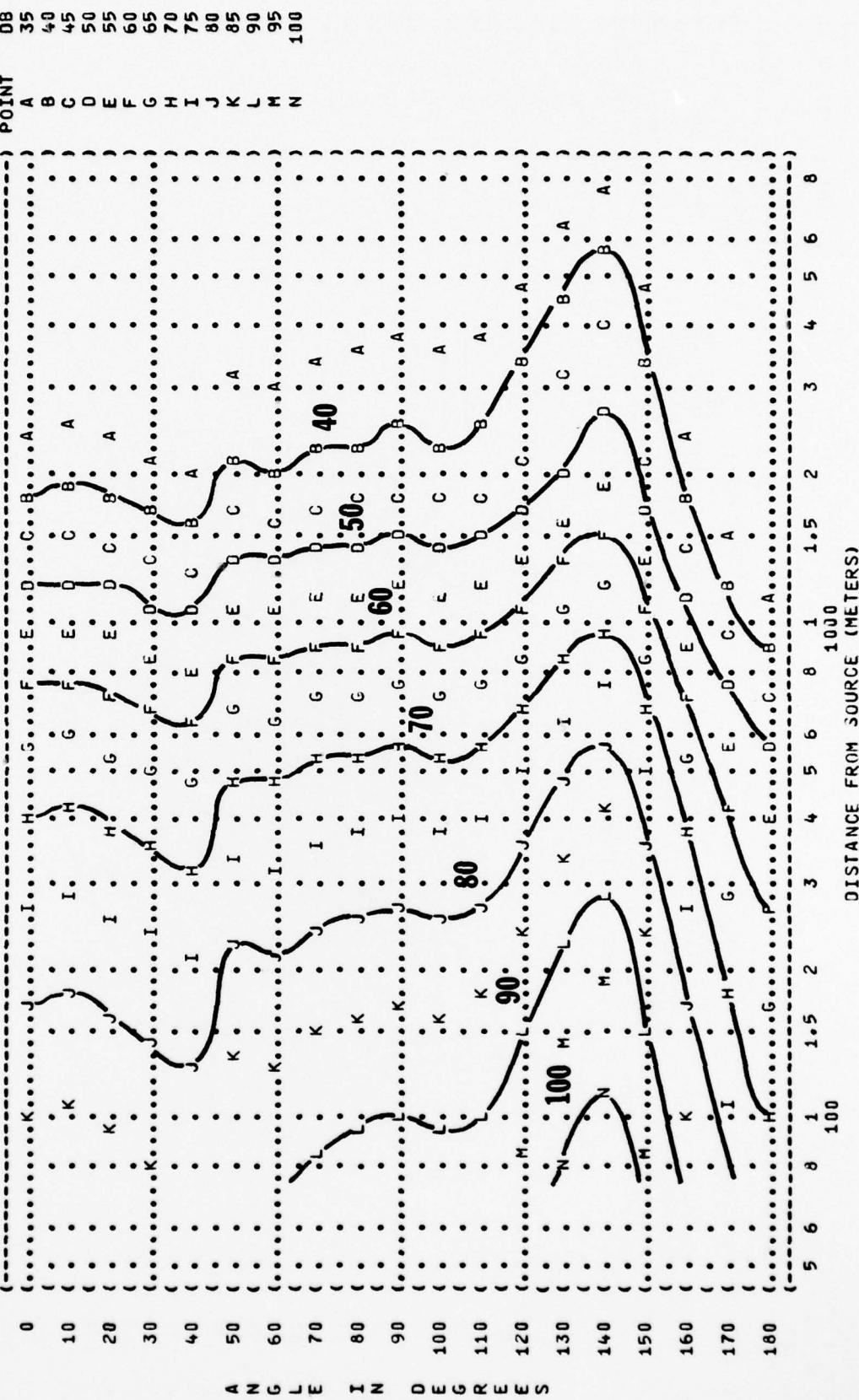


FIGURE: SOUND PRESSURE LEVEL (SPL)
11
 EQUAL LEVEL CONTOURS (08)
 1000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:
**T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE**

OPERATION:
 MILITARY POWER
 99.5% RPM
 BOTH ENGINES
 FREE FLOW

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 TEST 75-002-046
 RUN 03
 PAGE 23

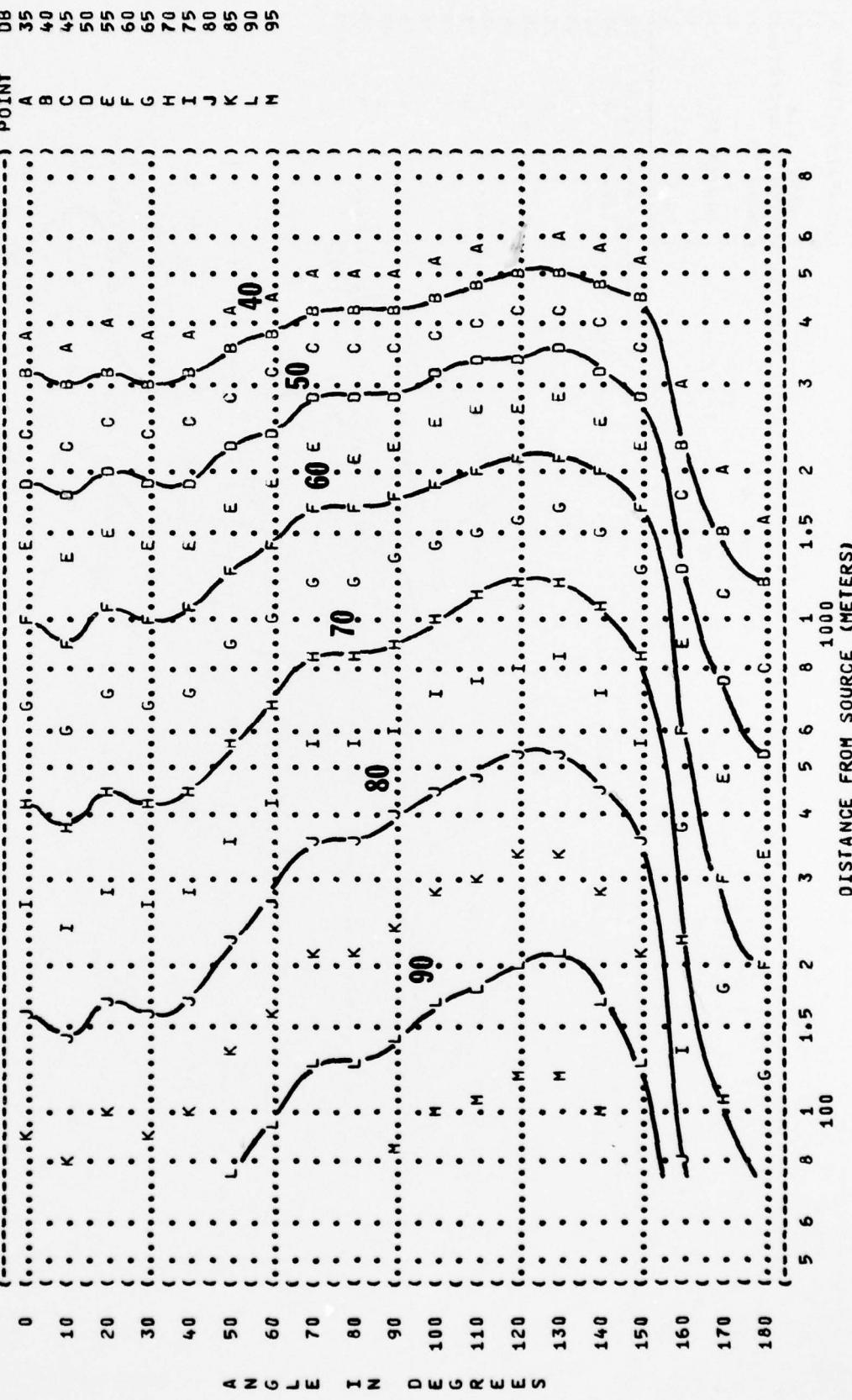


FIGURE 11 EQUAL LEVEL CONTOURS (DB)
T-37B AIRCRAFT
J69-T-25 ENGINE
FAR FIELD NOISE

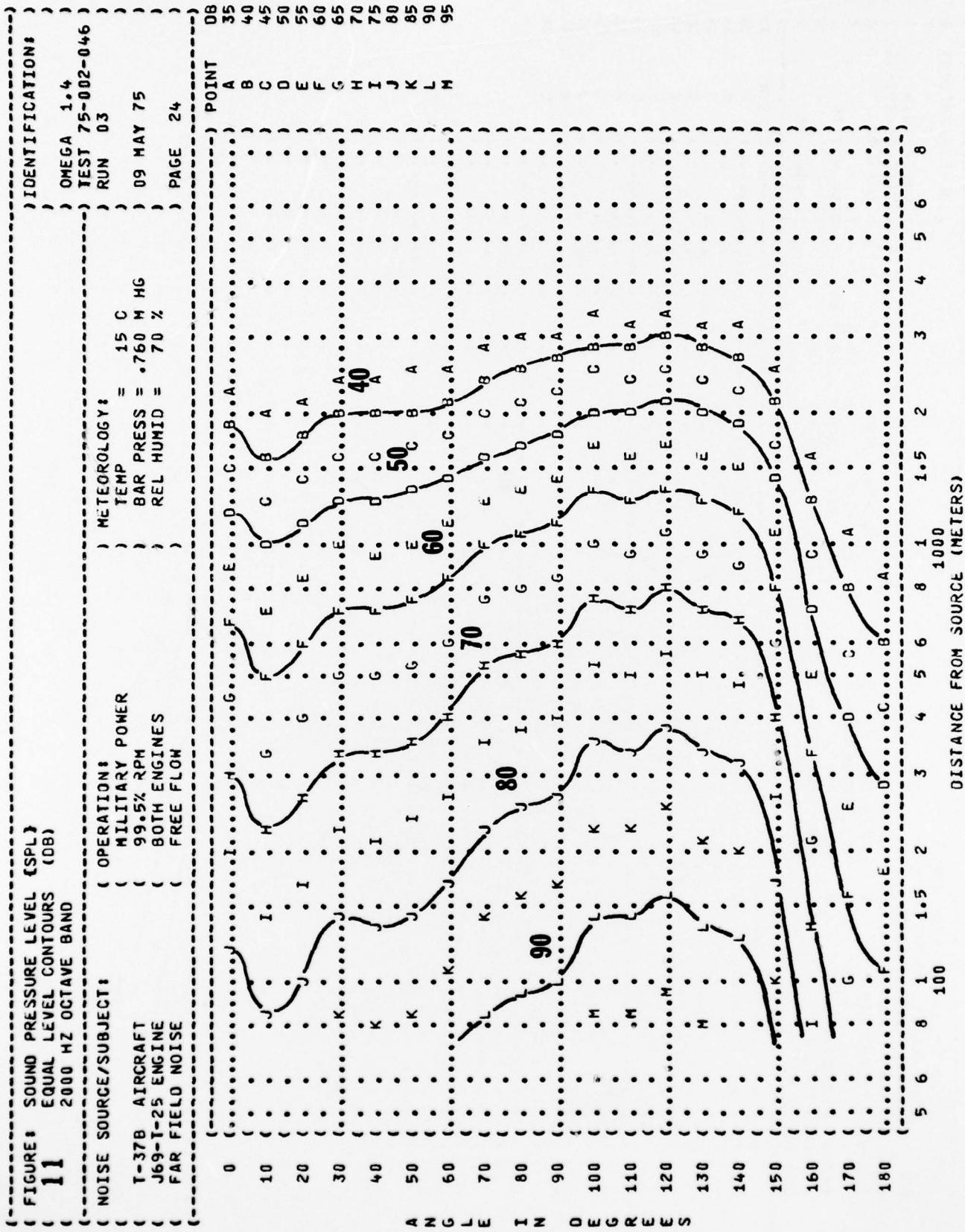


FIGURE: SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS (DB)
4000 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT
 J69-T-25 ENGINE
 FAR FIELD NOISE

OPERATION:
 MILITARY POWER
 99.5% RPM
 BOTH ENGINES
 FREE FLOW

IDENTIFICATION:
 OMEGA 1-4
 TEST 75-002-046
 RUN 03
 09 MAY 75
 PAGE 25

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %

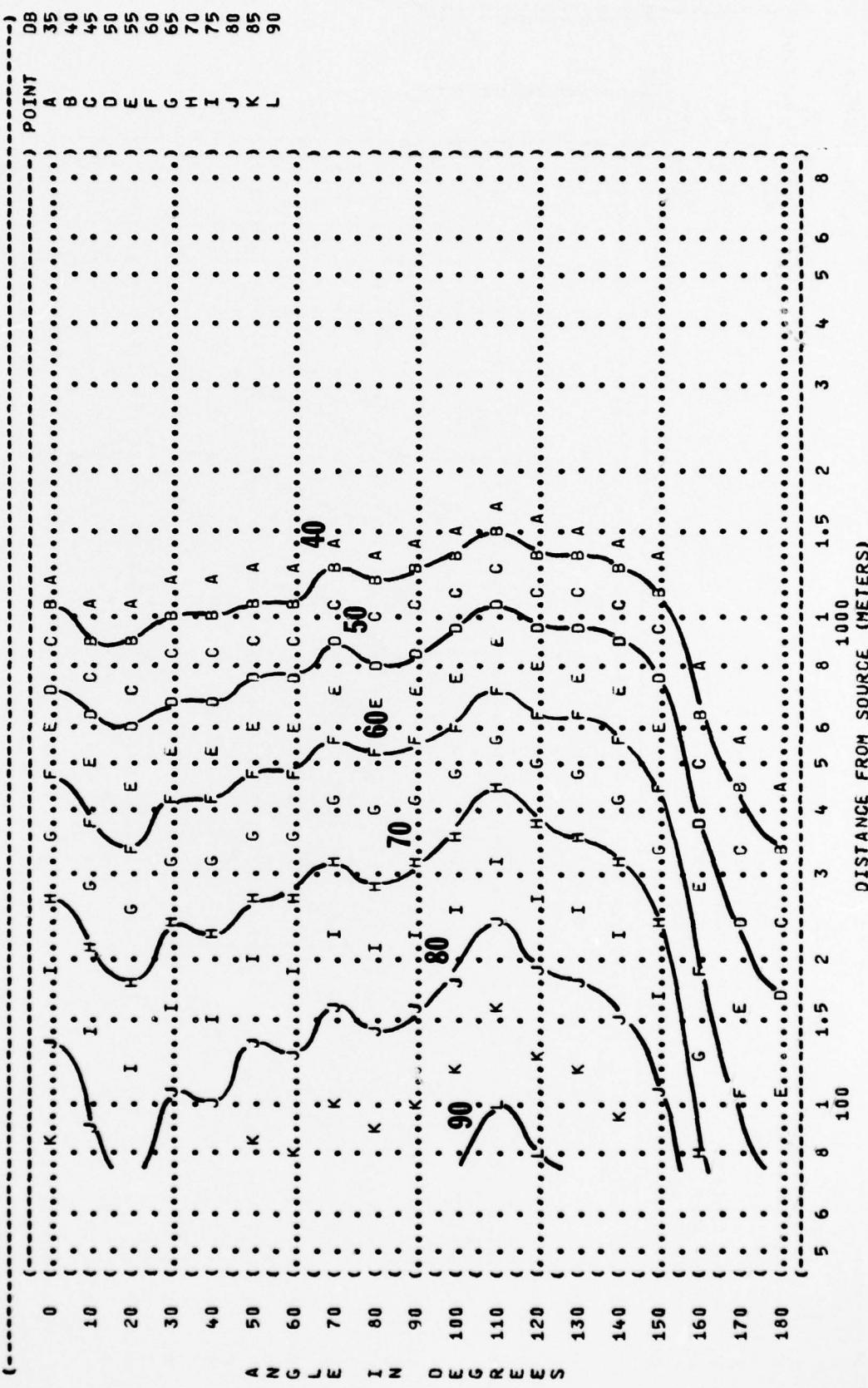


FIGURE: SOUND PRESSURE LEVEL (SPL)
11 EQUAL LEVEL CONTOURS (DB)
 8000 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT:

T-37B AIRCRAFT	OPERATION:	MILITARY POWER	TEMP = 15 C
J69-T-25 ENGINE	99.5% RPM	BAR PRESS = .760 M HG	09 MAY 75
FAR FIELD NOISE	BOTH ENGINES	REL HUMID = 70 %	RUN 03
	FREE FLOW		PAGE 26

NOISE SOURCE/SUBJECT:	OPERATION:	MILITARY POWER	TEMP = 15 C
T-37B AIRCRAFT	99.5% RPM	BAR PRESS = .760 M HG	09 MAY 75
J69-T-25 ENGINE	BOTH ENGINES	REL HUMID = 70 %	RUN 03
FAR FIELD NOISE	FREE FLOW		PAGE 26

